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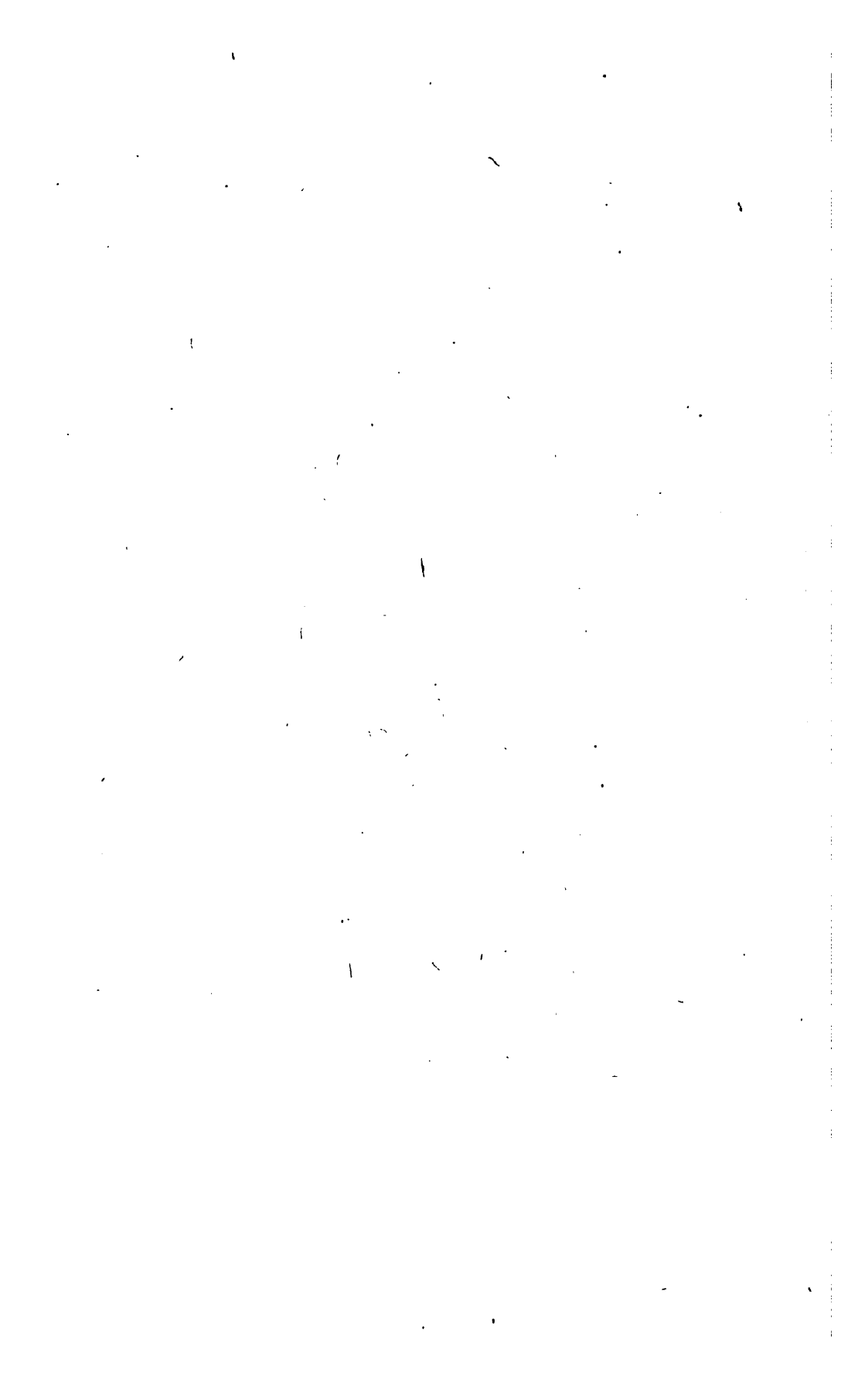
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1. The first part of the document is a list of names and addresses of the members of the committee. The names are listed in alphabetical order, and the addresses are given in full. The list is as follows:

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Mr. C. D. E.	1616 Birch St., St. Joseph, Mo.
Mr. F. G. H.	1717 Walnut St., Independence, Mo.
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Mr. S. T. U.	3030 Walnut St., St. Louis, Mo.
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1913-1914

BALTIMORE, MARYLAND

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JANUARY, 1915

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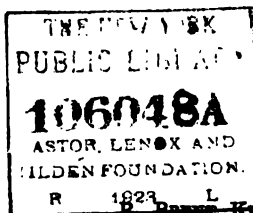
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ANNUAL REPORT
OF
THE JOHNS HOPKINS UNIVERSITY
1913-1914



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THE JOHNS HOPKINS UNIVERSITY CIRCULAR

New Series, 1915, No. 1

JANUARY, 1915

Whole Number, 271

ANNUAL REPORT OF THE UNIVERSITY

TO THE TRUSTEES OF THE JOHNS HOPKINS UNIVERSITY:—

Gentlemen:

As Chairman of the Administrative Committee I have the honor to submit to you the annual report of the University for the academic year ending June 30, 1914.

On the twenty-second of February, the President of the Board announced that the Trustees had that day unanimously elected as President of the University Frank Johnson Goodnow, LL. D., Eaton Professor of Administrative Law and Municipal Science in Columbia University since 1887 and for a year past Constitutional Adviser to the Republic of China. President Goodnow will assume the duties of his office on October first.

At the meeting of the Trustees, January 20, 1914, Mr. Daniel Willard, President of the Baltimore and Ohio Railroad Company, was chosen a member of the Board.

Dr. Christopher Johnston, Professor of Oriental History and Archæology, died June 26, 1914, after a long illness. Dr. Johnston had been connected with the University as

student and teacher since 1888, becoming successively university fellow, instructor, associate, associate professor, and professor. In the *Alumni Magazine* for November, 1914, there is printed a sketch of Dr. Johnston's life by a former pupil and two other friends, Dr. F. R. Blake, Mr. DeCourcy W. Thom, and Mr. Louis H. Dielman.

Among the new appointments in the Faculty the following are especially noteworthy:

Dr. Theodore Caldwell Janeway has been appointed Professor of Medicine. He has been connected with the faculty of Columbia University for many years, during the last five as Professor of the Practice of Medicine, and has had important official relations with the Rockefeller Institute for Medical Research and the Russell Sage Institute of Pathology. Dr. Janeway will also become Physician-in-Chief to the Johns Hopkins Hospital.

Dr. Lewellys F. Barker, who has held the professorship of Medicine and the position of Physician-in-Chief to the Johns Hopkins Hospital since 1905, has become Professor of Clinical Medicine and Visiting Physician to the Hospital.

The following appointments and promotions have also been made:

In the Philosophical Faculty

Alexander G. Christie, M. E., Associate Professor of Mechanical Engineering.

John C. French, Ph. D., formerly Associate, to be Associate Professor of English.

Aaron Ember, Ph. D., formerly Associate, to be Associate Professor of Semitic Languages.

Joseph C. W. Frazer, Ph. D., formerly Associate, to be Associate Professor of Chemistry.

E. Emmet Reid, Ph. D., Associate Professor of Organic Chemistry.

Grandville R. Jones, C. E., Associate in Civil Engineering.

William B. Kouwenhoven, Dr.-Ing., Instructor in Electrical Engineering.

Hugh S. Worthington, A. M., Instructor in Romance Languages.

Walter F. Shenton, Ph. D., Instructor in Mathematics.

Frank A. Ferguson, A. B., Assistant in Physics.

In the Medical Faculty

- Herman O. Mosenthal, M. D., Associate Professor of Medicine.
Leonard G. Rowntree, M. D., formerly Associate Professor of Experimental Therapeutics, to be Associate Professor of Medicine.
Edwards A. Park, M. D., formerly Associate, to be Associate Professor of Pediatrics.
Charles M. Campbell, M. D., formerly Associate, to be Associate Professor of Psychiatry.
Hans Lieb, M. D., Lecturer in Pharmacology.
Eli K. Marshall, Jr., Ph. D., formerly Associate in Physiological Chemistry, to be Associate in Pharmacology.
Benjamin B. Turner, Ph. D., formerly Assistant, to be Associate in Pharmacology.
George J. Heuer, M. D., formerly Assistant, to be Associate in Surgery.
Karl M. Wilson, M. D., formerly Instructor, to be Associate in Clinical Obstetrics.
Roy D. McClure, M. D., formerly Assistant, to be Instructor in Surgery.
David M. Davis, M. D., formerly Assistant in Pathology, to be Instructor in Urology.
George Peirce, M. D., Instructor in Urology.
Everett D. Plass, M. D., formerly Assistant, to be Instructor in Obstetrics.
Holland N. Stevenson, M. D., formerly Assistant, to be Instructor in Pathology.
David K. Henderson, M. D., formerly Assistant, to be Instructor in Psychiatry.
Paul G. Shipley, M. D., formerly Assistant, to be Instructor in Anatomy.
Ernest W. Goodpasture, M. D., Instructor in Pathology.
William McK. Marriott, M. D., Instructor in Pediatrics.
Felix Landois, M. D., Instructor in Surgery.
Mont R. Reid, M. D., Instructor in Surgery.
Lewis H. Weed, M. D., Instructor in Anatomy.
Albert Keidel, M. D., formerly Assistant, to be Instructor in Clinical Surgery.
Roades Fayerweather, M. D., formerly Assistant, to be Instructor in Clinical Surgery.
James R. Miller, M. D., Instructor in Clinical Obstetrics.
George E. Bennett, M. D., Assistant in Clinical Orthopedic Surgery.
James B. Holmes, M. D., Assistant in Pediatrics.
Henry W. Cave, M. D., Assistant in Surgery.

LeRoy N. Fleming, M. D., Assistant in Surgery.
 Willa M. Fricke, M. D., Assistant in Obstetrics.
 Charles C. Macklin, M. D., Assistant in Anatomy.
 Harry R. Muller, M. D., Assistant in Anatomy.
 Alice Rhodé, M. D., Assistant in Pharmacology.
 Charles A. Rouiller, Ph. D., Assistant in Pharmacology.
 Henry C. Schmeisser, M. D., Ph. D., Assistant in Pathology.
 Thornton Stearns, M. D., Assistant in Pathology.
 Carl W. Waldron, M. D., Assistant in Surgery.
 D. Wright Wilson, M. D., Assistant in Physiological Chemistry.
 Lloyd W. Ketron, M. D., Assistant in Clinical Dermatology.
 J. Scott Willock, M. D., Assistant in Clinical Dermatology.
 Lloyd B. Whitham, M. D., Assistant in Clinical Ophthalmology.
 Leo J. Goldbach, M. D., Assistant in Clinical Ophthalmology.

JOHNSTON SCHOLARSHIPS

The Johnston Scholarships have been held by Harry Bateman (Ph. D., Johns Hopkins, 1913), who has been reappointed for 1914-15; David S. Blondheim (Johns Hopkins, A. B., 1906, Fellow, 1909-10, Ph. D., 1910), Assistant Professor of Romance Languages in the University of Illinois; George M. Bolling (A. B., Loyola College, 1891, Fellow of Johns Hopkins University, 1893-94, and Ph. D., 1896), lately Professor of Greek and Sanskrit in the Catholic University of America. Dr. Blondheim has returned to his work in the University of Illinois, and Dr. Bolling has become Professor of Greek in the Ohio State University. The new appointees for 1914-15 are Eugene W. Burlingame (A. B., Yale, 1898, and A. M., 1902; Ph. D., Pennsylvania, 1910), who has held a fellowship in the University of Pennsylvania for four years, and John L. Campion (A. M., Columbia, 1912), who has been an instructor in Pennsylvania State College and in Princeton University during the past two years.

COMMEMORATION DAY

The exercises commemorating the thirty-eighth anniversary of the opening of the University were held on the morning of the twenty-second of February, in McCoy Hall, at 11

o'clock. Dr. William H. Welch, Chairman of the Administrative Committee of the Faculty, presided. Rev. Dr. Hugh Birkhead, rector of Emmanuel Church, acted as chaplain. The chief address was delivered by Hon. Andrew Jackson Montague, member of Congress for Virginia and formerly Governor of the State. His subject was "The Progress of American Democracy." A portrait, in oil, of Professor Edward H. Griffin, Dean of the College Faculty, was presented to the University by Mr. W. Calvin Chesnut, on behalf of the Alumni and some other friends of Dr. Griffin. Mr. R. Brent Keyser, President of the Board of Trustees, formally announced the election, as President of the University, of Dr. Frank Johnson Goodnow, Eaton Professor of Administrative Law and Municipal Science in Columbia University and Constitutional Adviser to the Republic of China, and also Dr. Goodnow's acceptance. The degree of Doctor of Medicine was conferred on one candidate and that of Bachelor of Arts upon one. The Henrico Medallion for 1914 was also awarded. (See page 10). The annual meeting and the annual dinner of the general Alumni Association were held in the evening at the Hotel Belvedere. An account of the public exercises is printed in the *University Circular*, April, 1914.

CONFERRING OF DEGREES

At the close of the year degrees were conferred in the Academy of Music, on Tuesday, June 9, at 4 o'clock, Dr. William H. Welch, the Chairman of the Administrative Committee, presiding. After prayer by the Rev. Adam S. Weber, D. D., pastor of Faith Reformed Church, degrees were conferred as follows: Bachelor of Arts on fifty-one candidates, Master of Arts on thirteen, Doctor of Philosophy on thirty, Doctor of Medicine on ninety. Hon. Robert Latham Owen, United States Senator from Oklahoma, gave the principal address. The presiding officer read the list of appointments in the faculty for the ensuing year and of honors won by the

students. The usual reception in honor of the graduates and their friends was held in McCoy Hall in the evening. A report of the public exercises appears in the *University Circular*, July, 1914.

ACADEMIC CELEBRATIONS

The academic and scientific gatherings at which the University has been represented include the following: Dedication of the Graduate College of Princeton University, Professor Bloomfield, delegate; installation of President Powell as President of Hobart College, Professor Vincent, delegate; inauguration of Dr. John H. Finley as President of the University and Commissioner of Education of the State of New York, our representative being Professor K. F. Smith; inauguration of President Guth, of Goucher College, the delegate being Professor Welch; First Annual Conservation Congress of Maryland, the University being represented by Mr. B. N. Baker and Professors Clark, Grave, Johnson, and Jones; the three hundredth anniversary of the University of Groningen, which Professor Bright attended as our representative; the twenty-fifth anniversary of Agnes Scott College, Georgia, our delegate being Dr. William H. Emerson, of Atlanta; the installation of the Vice-Chancellor of the University of the South, Professor Sioussat, of Vanderbilt University, as delegate; the seventy-fifth anniversary of the University of Missouri, Dr. Eugene L. Opie representing his Alma Mater; the inauguration of President Webb, of Randolph-Macon College, with Professor Latané as our representative, of President Farrand, of the University of Colorado, Dr. Henry Sewall, of Denver, being our delegate, and of President Chamberlain, of Denison University, Professor Bowen, of Ohio State University, representing us; Association of American Universities, Professor Willoughby, delegate; National Conservation Congress, in Washington, at which Mr. B. N. Baker and Professors Mathews and Swartz were delegates.

GIFTS AND BEQUESTS

The General Education Board has deposited with the University securities valued at approximately \$1,500,000, to establish the "William H. Welch Endowment for Clinical Education and Research." The purpose of this endowment is to aid in reorganizing clinical teaching in the departments of medicine, surgery, and pediatrics, so that the entire time of the teaching staff can be devoted to the work. Attention is called to the statement of the Dean of the Medical Faculty in the appendix to this report.

The General Education Board has also made a grant to the University of funds to be used for the increase of laboratory facilities and equipment necessary to make the reorganization of the clinical teaching effective.

The University has received, under the will of Mrs. Martha R. Quincy, a legacy of \$20,000 for the establishment of the "Walter Cottrell Quincy Fund," the income of which is to be divided among four students in the department of physics, selected by the President of the University for meritorious work in this department.

Dr. T. C. Gilchrist, of the Medical Faculty, has presented to the University the sum of \$200 to constitute the nucleus of a lending fund to aid deserving medical students.

The Henry Strong Educational Fund, of Chicago, allotted to the University for the year 1913-14, the sum of \$300 to be lent to deserving students, and two of our undergraduates availed themselves of this opportunity.

A portrait in oil of Professor Edward H. Griffin was given to the University on Commemoration Day by former students and other friends of Dr. Griffin. The portrait was painted by Mr. Thomas C. Corner, of Baltimore, and is an excellent likeness.

Mr. Logan G. McPherson has presented the sum of one hundred dollars, to be expended in the purchase of books dealing with railroad transportation and kindred problems.

PRIZES

The Henrico Medallion, presented by the Colonial Dames of America, Chapter I, was awarded on Commemoration Day to Clarence Pembroke Gould (A. B., 1907, Ph. D., 1911), in recognition of his study of "The Land System in Maryland, 1720-1765."

The Severn Teackle Wallis Memorial Prize was given on Commencement Day to Carl Scharf (A. B., 1914), for his essay entitled "The Picaresque Novel."

The Tocqueville Medal was bestowed, also on Commencement Day, to Aaron Schaffer (A. B., 1914), who presented an essay on "The First President of the Present French Republic."

The Adams Prizes, offered to the winners of the annual inter-class debate, were given to Malcolm H. Lauchheimer, Carl J. Weber, and Steuart D. White, representing the senior class; and the Adams Medal for excellence in public speaking was awarded to Thomas J. Tingley, of the second-year class.

PUBLICATIONS

The various serial publications of the University have appeared as usual. The list now includes the following journals:

The American Journal of Mathematics, in its thirty-sixth volume; the American Journal of Philology, in its thirty-fifth volume; Studies in Historical and Political Science, of which the thirty-second series is in progress, and several extra volumes have been issued; Modern Language Notes, of which twenty-nine volumes are nearly completed; and the University Circular, two hundred and sixty-seven numbers of which have appeared. The Contributions to Assyriology, Hesperia, the Journal of Terrestrial Magnetism, and occasional Memoirs from the Biological Laboratory, are also issued under the editorial direction of university professors.

PUBLIC LECTURES AND ASSEMBLIES

The nineteenth course of lectures on the Percy Turnbull Memorial Foundation was given by Professor George Lyman Kittredge, of Harvard University, April 27 to May 8. The course consisted of six lectures, and the subject was "The Poetry of Chaucer."

Two courses of lectures on the James Schouler Foundation were delivered,—the first by Professor Josef Redlich, of the University of Vienna, on "Political Problems of Austria-Hungary" (five lectures); the second by Hon. Charles Francis Adams, of Boston, his subject being "1643-1865. A Nationality: Its Inception; Its Development; Its Birth" (ten lectures).

The second course of lectures in America, under the auspices of the Japanese government, was delivered by Dr. Shosuke Sato, a Doctor of Philosophy of this University and now Professor of Agricultural Economics and Dean of the College of Agriculture of the Tohoku Imperial University at Sapporo. His subject was "The Fifty Years Progress of Japan," and was treated in six lectures, January 26 to February 6.

Dr. Hamilton W. Mabie, Exchange Lecturer in Japan in 1913 under the auspices of the Carnegie Endowment for International Peace, addressed an audience on "Our Neighbors, the Japanese," March 17.

The American Lectures on the History of Religions for the season of 1914-15 were delivered February 10-18 by Professor C. Snouck Hurgronje, of the University of Leyden, whose subject was "Islam," treated in four lectures.

Professor John A. Lomax, of the University of Texas, delivered a lecture on "The Songs of the Cowboy," January 15.

M. Fernand Baldensperger, Professor of Comparative Literature in the University of Paris, spoke on the subject of "French Enthusiasm About America, 1770-1789," February 4.

Dr. Wolfgang Ostwald, of the University of Leipzig, gave a series of five lectures on "Colloid Chemistry," January 26-30.

Mr. Francis R. Benson, Director of the Annual Shakespearean Festival at Stratford-on-Avon, addressed the students of the University, February 5.

The Honorable Bertrand Russell, Lecturer in Trinity College, Cambridge, lectured April 20 on "The Relation of Physics to Sense Data."

Professor J. J. Findlay, of the Victorian University of Manchester, England, lectured April 1 on "Labour and Learning: A Survey of Principles Underlying Educational Reform."

Professor Ernst Elster, of the University of Marburg, lectured (in German) on "Heine," April 1.

Mr. Frederick W. Besley, State Forester of Maryland, spoke on "The Forests of Maryland," March 10.

Mr. Jordan Herbert Stabler, of the Department of State, Washington, gave an illustrated lecture on "Baños, the Gateway to the Ecuadorian Oriente and the Headwaters of the Amazon," March 16.

A recital of Tennyson's "Enoch Arden," to Strauss' musical setting, was given March 20 by Mr. Herbert D. Bard and Mr. Thomas Moss, of the Tome School for Boys.

Courses or single lectures were given before various departments of the University as follows:

Dr. Frederick E. Wright, of the Geophysical Laboratory of the Carnegie Institution, fifteen lectures on "Experimental Geology."

Dr. James Brown Scott, Secretary of the Carnegie Endowment for International Peace, two lectures weekly, throughout the session, on "Principles of International Law" and the "Fundamental Rights and Duties of States."

Mr. Ernest Bruncken, of the Library of Congress, ten lectures on the "Theory of the State."

Dr. Charles G. Fenwick, of the Carnegie Endowment for International Peace, ten lectures on "Historical Foundations of Present European International Politics."

Mr. Logan G. McPherson, Director of the Bureau of Railway Economics, five lectures on "Present Problems in Railway Transportation."

Dr. Franz Oppenheimer, of the University of Berlin, two lectures on "The Theory of Wages."

Professor Karl Rathgen, of Hamburg, Germany, two lectures on "Some Present Economic Problems of Germany." [These lectures were given in the physical lecture room and were open to a general audience.]

Professor Joseph Schumpeter, of the University of Graz, the first Austrian Exchange Professor sent to the United States, five lectures on "Capital and Labor."

Professor A. P. Winston, of the University of Kansas, five lectures on "The Economic Life of China."

Professor Don C. Barrett, of Haverford College, five lectures on "The Greenbacks and Resumption of Specie Payments."

Professor Frank A. Updyke, of Dartmouth College, ten lectures on "The Diplomacy of the War of 1812." [Albert Shaw Lectureship.]

Professor Hugo A. Rennert, of the University of Pennsylvania, one lecture on "Lope de Vega in His Own Plays and Ballads."

Professor Frederick M. Warren, of Yale University, one lecture on "The Influence of Latin Style on Mediæval French Poetry."

Professor Abel Lefranc, of the University of Paris, one lecture on "Rabelais."

Professor F. Baldensperger, of the University of Paris, one lecture on "Alfred de Vigny et l'Angleterre."

The seventeenth annual Inter-class Debate and Contest in Public Speaking by students of this University were held in McCoy Hall, March 13.

The second triangular Intercollegiate Debate (the thirteenth annual contest) between students of the Johns Hopkins University, the University of Virginia, and the University of North Carolina was held April 18. As was the case in 1913, the North Carolina and Virginia debaters met in Baltimore, in McCoy Hall; the two "teams" from this University meeting their opponents in Chapel Hill and Charlottesville and winning both contests.

The third Intercollegiate Contest in Oratory for prizes offered by the Intercollegiate Peace Association was held in McCoy Hall, March 27. There were contestants from Georgetown and the Johns Hopkins universities, Loyola, St. John's, and Washington colleges.

The University halls have been used as follows:

The Archaeological Institute of America, Baltimore Society,—annual meeting, with a lecture by Mrs. S. Arthur Strong, Assistant Director of the British School in Rome, on "Art and Empire: The Influence of Roman Imperialism on Later Antique Sculpture," November 14; lecture by Professor Edward K. Rand, of Harvard University, on "Horace's Sabine Farm," January 29; lecture on "Phœnician, Roman, and Byzantine Ruins of Tunisia," by Mr. Frank E. Johnson, April 14; lecture by Professor Oliver S. Tonks, of Vassar College, on "Raphael," April 24.

The Municipal Art Society,—lecture on "Moorish Art and Architecture in Spain," by Professor Charles Upson Clark, of Yale University, November 11; addresses by Hon. Henry D. Harlan, William M. Ellicott, Esq., and B. Howard Haman, Esq., on "The National Forest and Park,—Maryland's Opportunity," November 28; lecture by Professor A. D. F. Hamlin, of Columbia University, on "Towers of the Old World and the New," December 16; annual meeting, January 20, with a lecture on "Decorative Arts," by Mr. C. Howard Walker, of Boston; lecture by Mrs. James W. Hazelhurst on "French Chateaux," February 19; lecture by Professor

Walter S. Perry, on "Renaissance Architecture and Decoration," March 19; lecture April 16 on "The Architecture of Japan," by Professor Warren P. Laird, of the University of Pennsylvania.

The National Academy of Sciences,—fall meeting of 1913, in the Physical Laboratory, November 18 and 19.

The Alliance Française, Baltimore Section,—lectures on alternate Saturday mornings by M. Jean Ducros, on "La Poésie après les Romantiques."

Under the auspices of the Faculty of the Teachers' Training School and the School Arts League of Baltimore, a lecture by Mr. William M. Chase, on "Whistler and Some Modern Ideas," January 23.

The first annual conference of the Maryland Conservation Association, February 24, 25.

The ninth Maryland Conference of Charities and Correction, November 19-21.

In addition the following meetings have been held: Women's Christian Temperance Union, November 22; Federated Charities, annual public meeting, November 25; third annual meeting of the St. Vincent de Paul Society and of the Associated Catholic Societies, January 26; public meeting with an address by Dr. H. B. Frissell, Principal of Hampton Institute, on "How the Institute can help the Negro Situation in Baltimore," February 16; Social Service Commission of the Inter-Church Federation, February 13; History Teachers' Association, February 28; Conference of Private School Principals and Parents, March 30; Maryland Federation of Women's Clubs, April 22, 23; Home Visitation Committee, May 4; Society of the Cincinnati, May 13 and 14; Home Garden Committee, May 22.

BUREAU OF APPOINTMENTS

A Bureau of Appointments, authorized last year by the Trustees, has been organized, with Dr. R. V. D. Magoffin as Director. The object of the Bureau is to secure for gradu-

ates of the University or for resident students permanent positions, as well as employment for students desiring to earn their expenses in whole or in part while in residence. There is a Committee on Appointments, consisting of Dr. Magoffin (chairman), Professors Buchner, Mathews, Tilden, and French. A statement of the first year's operations is included in the appendix to this report.

OPPORTUNITIES FOR TEACHERS

The opportunities offered to teachers through the College Courses for Teachers given in co-operation with Goucher College, and through the Summer Courses, were continued. The former, which have been in operation for five years, were attended by 167 persons, and the fourth session of the Summer Courses attracted 287. Extended reports on these activities are printed in the appendix. In addition to the above, many of the regular graduate courses were opened, at convenient hours, to teachers, who were thus afforded an opportunity to secure credit towards advanced degrees.

DEPARTMENT OF ENGINEERING

The work of the Department of Engineering has progressed rapidly during the year. Of special interest was the beginning on August 20th of the construction of the new laboratory of Mechanical and Electrical Engineering at Homewood and its rapid progress towards completion. By the end of the year it was evident that the building could be occupied in the fall of 1914, and plans were made for beginning the work in all three branches of Engineering in the new building at the opening of the academic year 1914-15.

The Power House for the furnishing of light, heat and power for the University has also been well advanced in construction. The Power House also includes much equipment for laboratory instruction. It is probable that the plant will be in operation early in the coming year.

Among the questions which have engaged attention in the organization of the work of the Department in its new home are the purchase and installation of the equipment of the laboratories, the inspection and putting in operation of the power plant, the arrangement of a curriculum and schedule permitting work partly in the city and partly at Homewood, the adjustment of a new set of requirements for entrance and the putting in operation of the system of awarding State Scholarships required by the Legislative Bill making possible the establishment of the Department.

The following additions to the faculty of Engineering have been made:

Alexander G. Christie, Associate Professor of Mechanical Engineering in the University of Wisconsin, to be Associate Professor of Mechanical Engineering;

Grandville R. Jones, Professor of Sanitary Engineering in the University of Kansas, to be Associate in Civil Engineering;

Wm. B. Kouwenhoven, Instructor in Electrical Engineering in Washington University, to be Instructor in Electrical Engineering.

In the appendix will be found a detailed report on the work done during the year, with a list of the holders of scholarships for 1913-14.

UNIVERSITY VISITOR TO SOUTHERN COLLEGES

During the month of April, 1914, Professor John H. Latané made a trip through the Southern States as University Visitor. The following institutions were included in the itinerary: Vanderbilt University at Nashville, Tennessee; the University of the South at Sewanee, Tennessee; the University of Alabama at Tuscaloosa; the University of Mississippi at Oxford; Tulane University and Sophie Newcomb College at New Orleans; the University of Georgia at Athens; Trinity College at Durham, North Carolina, and the University of North Carolina at Chapel Hill. In most cases arrangements were made for Professor Latané to address either the whole student body or the students in the departments of history,

economics, and politics. He was received everywhere with marked cordiality both by the Johns Hopkins alumni and by the college and university authorities. Educational conditions in the South have improved greatly during the past five or six years, and rapid progress is now being made. It is gratifying to note the prominent part taken by Hopkins men in this movement. The policy of sending out each spring a University Visitor has met with the most cordial response, and it seems highly desirable that it should be continued as a permanent policy.

SOUTHERN SCHOLARSHIPS

At the request of the Alumni Council, the Trustees have established ten graduate scholarships which are offered to candidates from States of the South and Southwest, other than Maryland, Virginia, and North Carolina. These are similar to the scholarships established at the opening of the University, in accordance with the will of the founder, for the benefit of residents of the three States named, and are likewise known as "Hopkins Scholarships." The first award will be made for the year beginning October 1, 1914.

HOMEWOOD

At the beginning of the year the ground plans at Homewood had been carried out in their general outline. It remained to spread the top-soil and plant the grass where the sod would not be disturbed by future building operations. The entrance portion of the grounds, or "Bowl," has been completed and planted, the Bowl road-beds have been laid and opened to traffic, and the adjacent landscape planting has been finished. The completed Bowl gives an impression of size and importance to the main entrance that was lacking until the final adjustment of the contours was made, and the result seems amply to justify the considerable care and pains taken,

The Academic Building, facing the main quadrangle from the rear, is completed, except for the Memorial Room and Passage-way which are reserved for special decoration. A fund has been contributed for this special decoration and the details should be finished within the next few months, although the building could now be occupied in its present state. The structure as a whole is eminently satisfactory, being sufficiently large to dominate architecturally the Main Quadrangle group, while simple and pleasing in its lines and construction.

The Mechanical and Electrical Engineering Building, the Power House, and the underground service-tunnels for all the buildings of the Main Quadrangle group are well along towards completion. The Engineering Building, as well as the Power House, which has been constructed with special laboratory facilities for Mechanical Engineering, will be ready for service by October 1. Pictures and descriptions of these buildings have been published in the *Alumni Magazine* and elsewhere.

The plans of the Geological, Physical and Chemical Laboratories are advancing, and it is the expectation that bids will be invited during the coming year on the finished working-drawings and specifications. With the bids in hand, these laboratories can be built promptly—easily within one year,—when funds for their erection become available. The advances for the Homewood Development out of the general funds of the University having now amounted to a considerable sum, the erection of additional buildings must depend upon the securing of additional funds.

Respectfully submitted,

WILLIAM H. WELCH,

*Chairman of the
Administrative Committee of the Faculty.*

June 30, 1914.

REPORTS ON THE INSTRUCTION IN THE CHIEF BRANCHES OF STUDY

Prepared by the Principal Instructors in the Several Departments

MATHEMATICS

GRADUATE COURSES

Professor Morley gave the following courses:

1. Higher Geometry. *Three hours weekly, first half-year.*

The axioms of geometry were first considered. Then various geometric transformations were taken up, and the theory of rational curves and surfaces was especially discussed.

2. Theory of Functions. *Three hours weekly, second half-year.*

The general subject of one-valued functions was developed with special reference to the elliptic functions.

Associate Professor Coble gave the following course:

Discontinuous Groups. *Two hours weekly throughout the year.*

After the elements of finite group theory were introduced, various representations of the more important related continuous groups were considered along with their associated non-Euclidean geometries. This led naturally to the discontinuous sub-groups and to the automorphic functions connected with them. Some particular cases were treated in detail along this line.

Dr. Cohen gave the following courses:

Elementary Theory of Functions. *Two hours weekly through the year.*

After a preliminary study of the theories of sequences and series, a study of functions of the complex variable, from both the Weierstrass and Cauchy points of view was made. The greater part of the course was devoted to single-valued functions.

Differential Geometry. *Two hours weekly through the year.*

After a study of curves in space, the general theory of surfaces was taken up. Such topics as curvature of surfaces, lines upon surfaces, applicability and mapping were discussed at length.

Dr. H. Bateman gave a course on the Theory of Potentials. *One hour weekly through the year.*

The Seminary and reading class met each week.

The American Journal of Mathematics is in its thirty-sixth volume. The January number contained a portrait of W. Stahl.

The degree of Doctor of Philosophy was bestowed on J. W. Gain, H. C. Gossard, Miss B. I. Miller, W. F. Shenton, Miss M. M. Young.

The undergraduate courses were conducted by Professor Hulburt, Associate Professor Cible, Dr. Cohen, Dr. Bateman, and Mr. W. F. Shenton.

FRANK MORLEY,
Professor of Mathematics.

PHYSICS

The Physical Laboratory has been open daily during the year for the work of advanced and undergraduate students. Regular courses of lectures have been given, and meetings have been held weekly for the reading and discussion of the current journals. The Physical Seminary has also met once each week, and the list of papers presented is given below.

This year marks the formal opening of the Department of Engineering, and therefore those courses in Applied Electricity which in the past have been included in the work of the Physical Laboratory are now to be found in the new department.

The regular courses of instruction were as follows:

By Professor Ames:

1. Physical Seminary. *One hour weekly, through the year.*
2. Theoretical Mechanics. *Four hours weekly, through the year.*
3. Undergraduate Physics I. *Three hours weekly, through the year.*

By Professor Bliss:

1. Undergraduate Physics II: Mechanics and Thermodynamics. *Three hours weekly, through the year.*
2. Undergraduate Physics III: Electricity and Magnetism. *Three hours, weekly, first half-year.*

By Associate Professor Pfund:

1. Undergraduate Physics III: Physical Optics. *Three hours weekly, second half-year.*

By Associate Professor Anderson:

1. Celestial Mechanics. *Two hours weekly, through the year.*
2. General Astronomy. *Three hours weekly, through the year.*

The laboratory work for undergraduates has been under the direction of Professor Bliss and Dr. Pfund, with the assistance of Dr. S. J. Plimpton and Messrs. F. J. Haverstick and E. O. Hulburt. The work in the Astronomical Observatory was directed by Professor Anderson with the assistance of Mr. Donald MacKenzie. The advanced work and the original investigations have been under the direction of Professors Ames, Whitehead, Pfund, and Anderson.

In the Physical Seminary papers on the following subjects were read and discussed:

Professor Ames—Recent Theories concerning the Structure of Atoms.

Professor Anderson—The Magnetic Field of the Sun.

Dr. S. J. Plimpton—Diffraction of Röntgen Rays.

Mr. D. S. Elliott—Recent Developments of the Zeeman Effect.

Mr. W. S. Gorton—Phenomena of the Corona in connection with High Tension Wires.

Mr. Donald MacKenzie—The Corona with Constant Potentials.

Mr. A. F. Gorton—The Phenomena of Photo-Electricity; The Quantum Hypothesis.

Mr. E. O. Hulburt—The Structure of Atoms; The Laws of Radiation.

Mr. E. Karrer—The Phenomena of Phosphorescence: The Physical Properties of the Human Eye.

Mr. R. W. Dickey—The History of Mechanics before Newton; Radio-active Transformations.

Mr. W. S. Brown—Development of the Idea of Mass; Properties of Alloys.

Dr. C. W. Hewlett—The Results of the Atmospheric Electric Observations on the Second Cruise of the "Carnegie," June, 1910 to December, 1913.

There were nine advanced students who followed Physics as their principal subject; and of these four absolved the requirements for the degree of Doctor of Philosophy, and one for the degree of Master of Arts. The names of the former with the titles of their dissertations are as follows:

Mr. D. S. Elliott—A Comparative Study of the Light Sensibility of Selenium and Stibnite at 20° and 190° C.

Mr. W. S. Gorton—The Effect of Frequency upon the Corona.

Mr. Enoch Karrer—A Method of Determining the Radiant Luminous Efficiency of a Light Source by Means of a Cell Whose Transmission Curve is Identical with the Luminosity Curve of the Average Eye.

Mr. Donald MacKenzie—The Corona in Air at Continuous Potentials and Pressures Lower than Atmospheric.

Mr. A. F. Gorton received the degree of Master of Arts, the subject of his essay being The Quantum Theory of Radiation.

Professor Wood has been absent during the year, devoting nearly the entire time to experimental investigations carried on in the laboratories of the Sorbonne in Paris. The results of these are now being published in various periodicals. He received an honorary degree from the University of Birmingham on the occasion of the meeting of the British Association in the summer of 1913.

Dr. Anderson returned to the University after a year with the Mt. Wilson Observatory in Pasadena, California. In addition to his duties as Director of the Astronomical Observatory he has had charge of the ruling of diffraction gratings in this laboratory, and during the past year has produced an unusually large number of practically perfect gratings. There has been constructed also in our machine shop under his direction a caliper having an accuracy of one one-hundredth thousand of an inch.

Dr. Pfund during the summer of 1913 was able through the courtesy of the Director of the Allegheny Observatory to make use of the telescope in this Observatory in order to apply his new thermocouple to the measurement of the heat radiation from certain of the fixed stars. In this he was successful, and his work is notable as being the only accurate determination thus far made of this most important quantity. During the winter he has been interested largely in the study of the sensitiveness to light of certain substances.

JOSEPH S. AMES,

Director of the Physical Laboratory.

CHEMISTRY

The following courses of instruction were given in the Chemical Department:

I. An elementary course of experimental lectures, accompanied by classroom conferences and examinations, and extending through the year.

II. A laboratory course, also extending through the year, which was taken simultaneously with Course I, and was designed to familiarize beginners with the experimental side of chemistry.

Courses I and II were under the charge of Professor Gilpin, who was aided by a lecture assistant and two laboratory assistants.

III. *Systematic Inorganic Chemistry*, a lecture course extending through the year, which was taken by undergraduates who had previously completed courses I and II, and by some first-year graduates from other institutions.

IV. A laboratory course extending through the year, in the reactions and preparation of inorganic compounds and in qualitative analysis. This course was taken in conjunction with course III.

Courses III and IV were under the direction of Associate Professor Lovelace, who was aided by two laboratory assistants.

V. *Systematic Organic Chemistry*.

A course of lectures given by Professor Gilpin which extended through the year, and was taken by the more advanced undergraduates and the less advanced graduates from other institutions.

VI. A laboratory course under the direction of Professor Gilpin, in the reactions and preparation of organic compounds.

VII. An advanced course, under Associate Professor Acree, in the preparation of organic compounds.

VIII. A course of lectures by Professor Jones on physical chemistry, which extended through the year and was supplemented by a laboratory course in the experimental methods of physical chemistry. Professor Jones was aided by a laboratory assistant.

IX. A laboratory course in quantitative chemistry by Professor Morse which extended through the year.

X. Advanced Graduate Chemistry.

This is a composite course of two or three years' duration given by the members of the teaching staff, in which selected important topics in chemistry are discussed with greater thoroughness than is practicable in the more elementary courses.

The following courses under schedule X have been given during the past academic year:

1. By Professor Morse on Osmotic Pressure.
2. By Associate Professor Lovelace, on Applied Electrochemistry and Some Periodic Relations among the Elements.
3. By Associate Professor Acree on Sugars, Starches and Cellulose and on Dye Stuffs.

XI. Journal Meetings for reports on the current literature of chemistry, by the instructors in chemistry and the advanced students.

Professor Morse, Doctors Frazer and Holland, and Messrs. Frederick, Musselman, Coolidge, and Huntley have continued the investigation of the osmotic pressure of aqueous solutions. The pressures measured were those of mannite at 10°, 20°, 30°, and 40°; of glucose at 30°, 40°, 50° and 60°; and of potassium and lithium chlorides and certain other electrolytes at 30°.

The more important results of this extensive and long continued investigation have been incorporated in a monograph which is published by the Carnegie Institution of Washington.

Professor H. C. Jones, with the assistance of Dr. E. P. Wightman, P. B. Davis and E. J. Shaeffer, working under grants from the Carnegie Institution of Washington, and Messrs. Holmes, Lloyd, Paulus, Putnam, Watkins and Wiesel, have been engaged on the following investigations:

Dr. Wightman and Mr. Wiesel have studied the conductivities and dissociations of certain organic acids in ethyl alcohol. They improved the method and apparatus used in such work, and studied a number of the more common acids. The conductivities of the organic acids investigated in this solvent were surprisingly small.

Dr. Shaeffer and Mr. Paulus have continued the work on the absorption spectra of solutions, which has now been in progress here continuously for the past nine years. They worked with the radio-micrometer studying quantitatively absorption spectra. They greatly improved the method and apparatus used, and repeated the work of Dr. Guy. They obtained the same general results, viz.; that aqueous solutions of salts which are only slightly hydrated are, in general,

equally transparent with water; except at the centres of the absorption bands where the salt solutions are the more opaque.

Aqueous solutions of strongly hydrated salts are more transparent than pure water, the difference amounting to as much as 40 per cent. They also investigated, by means of the radiomicrometer, the absorption bands in mixtures of the alcohols with water.

Dr. Davis and Mr. Putnam worked on the conductivities, dissociations and viscosities of certain salts, especially those of rubidium and ammonium in ternary mixtures of acetone, glycerol and water. They also made substantial progress in the study of the physical chemistry of formamid as a solvent.

Mr. Holmes investigated the behavior of non-hydrated or slightly hydrated salts on the rate of ester saponification. The idea in mind was that water of hydration would have different chemical action from free water. Results have already been obtained which favor this assumption. Other chemical reactions, such as the decomposition of amides and acid chlorides are being brought within the scope of this work.

Mr. Lloyd studied the conductivities, dissociations and temperature coefficients of conductivity and dissociation, of a number of the less common salts of potassium.

Mr. Watkins investigated the conductivities, dissociations and temperature coefficients of conductivity and dissociation of the rarer salts of sodium.

Associate Professor Acree has had associated with him in research work Dr. C. N. Myers, employed under a grant from the Carnegie Institution of Washington, and Messrs. H. A. Lubs, W. A. Taylor, W. F. Clarke, D. F. Smith, L. S. Pratt, F. C. Lee, E. H. Wight, E. C. White, R. N. Mullikin, L. G. Wesson.

Dr. C. N. Myers and Mr. W. F. Clarke have continued their work on the hydrogen, calomel and silver chloride electrodes and have found that these may be easily reproduced to within 0.00001 volt.

Mr. Lubs has worked on the formation of sulphones from thiourazoles and has studied the tautomeric reactions of the sulphones and their salts with diazoalkyls and alkyl halides.

Mr. W. A. Taylor has studied the reactions of methyl iodide with sodium ethylate at 0° and has found a new interpretation of the formula $KN = K_1 + a \log V$ used by Hecht, Conrad and Brueckner.

Mr. D. F. Smith has made a study of the efficiency of a new form of apparatus for maintaining balances and substances in an atmosphere freed from moisture. He has, further, made a study of the specific gravity of pure alcohol and, in this connection, of mercurial thermometry.

Mr. L. S. Pratt has made a quantitative study of the tautomeric relations involved in 1-phenyl-3-oxy-4-phenyl-5-thiourazole and its salts and of the corresponding thioiazolon and its salts.

Mr. Frederic C. Lee has studied the action of methyl iodide on the barium salt of 1-phenyl-3-methyl sulphonyl-4, 5 dihydro-5-oxy-triazol to determine what tautomeric relationships are involved.

Mr. E. H. Wight has studied the reactions of methyl iodide and the mercury salt of 1-phenyl-3-methyl sulphonyl-4, 5-dihydro-5-oxotriazol and found that the *N*-CO-esters are formed in constant ratios.

Mr. E. C. White has studied the reactions of phenolsulphon phthalein and learned that this substance shows all the properties demanded by the theory that the chief source of color in the salts of such phthaleins is the quinone phenolate group. The aqueous solution of the acid is yellow as is also the solution of the monobasic salt; but the dibasic salt containing the quinone phenolate group is deep pink whether in solution or in the solid state.

Mr. Mullikin and Mr. Weason have studied the pinacone-pinacolone rearrangement in order to discover the mechanism of the reactions involved.

Mr. Hopkins has begun the study of the reactions of alkyl hydroxylamines with ketones and aldehydes in neutral, acid and alkaline solution to discover whether the ions or molecules, or both, are active.

Associate Professors Frazer and Lovelace have had the assistance of Mr. Ellis Miller in their work in the measurement of the depression of the vapor pressure of water produced by dissolved substances.

A list of the papers which were published by the members of the staff and others connected with the laboratory is given below:

H. N. Morse. The Osmotic Pressure of Aqueous Solutions. Report on Investigations made in the Chemical Laboratory of the Johns Hopkins University during the years 1899-1913. Published by the Carnegie Institution of Washington.

A Quantitative Study of Absorption Spectra by means of the Radiomicrometer, by J. Sam Guy and Harry C. Jones. *American Chemical Journal*, 50, 257, (1913).

Evidence bearing on the Solvate Theory of Solution, by Harry C. Jones. *Journal Franklin Institute*, November and December, (1913).

Leitfähigkeit und Viskosität von Lösungen von Rubidiumsälze in Gemischen von Aceton und Wasser, by P. B. Davis, H. Hughes and Harry C. Jones. *Zeitschrift phys. Chemie* 65, 513, (1913).

Eine quantitative Untersuchung der Absorptionsspektren von Lösungen mittels des Radiomicrometers, by Harry C. Jones and J. Sam Guy. *Annalen der Physik* 43, 515, (1914).

The Conductivity and Viscosity of Solutions of Potassium Iodide and Sodium Iodide in Mixtures of Ethyl Alcohol and Water, by E. P. Wightman, P. B. Davis, A. Holmes and Harry C. Jones. *Journal de Chimie physique*. (1914).

The Absorption Spectra of Non-Hydrated and of Hydrated Salts as Studied by means of the Radiomicrometer, by E. J. Shaeffer, M. G. Paulus and Harry C. Jones. *Phys. Zeit.*, May, 1914.

Evidence obtained in this Laboratory during the past Four Years bearing on the Solvate Theory Solution, by Harry C. Jones. *Zeit. phys. Chem.* 1914.

Three papers on the reactions of both ions and molecules of acids,

bases and salts, under the following titles, have been sent to the *Journal of the American Chemical Society* for publication:

On the Reaction of Methyl Iodide and Sodium Aldehyde at 25°, by Associate Professor Acree and H. C. Robertson, Jr.

On the Reaction of Ethyl Iodide and Sodium Ethylate at 25°, by Associate Professor Acree and E. K. Marshall, Jr.

A Re-interpretation of the Reactions of Sodium Ethylate with 1, 2-Dinitrobenzene, 1, 2, 4-Dinitrochlorbenzene and 1, 2, 4-Dinitrobrombenzene by Associate Professor Acree.

The number of students working in the laboratory was 117 during the first half year and 122 during the second half year. Of these 58 were graduates, of whom 43 were following chemistry as their principal subject during the first half year and 42 during the second.

Messrs. E. Miller and M. G. Paulus were appointed fellows in chemistry for the academic year 1914-15.

Volume L of the *American Chemical Journal* was issued during the year. With the completion of this volume the journal was discontinued as a separate publication and beginning January, 1914, was incorporated with the *Journal of the American Chemical Society*.

Associate Professor Acree's resignation was accepted in June, 1913, and Dr. J. C. W. Frazer and Dr. E. E. Reid were appointed Associate Professors of Chemistry in May 1914.

HARMON N. MORSE,

Director of the Chemical Laboratory.

GEOLOGY

The Geological Laboratory was open daily throughout the year for graduate and undergraduate students. Lectures and classroom work were conducted as follows:

(a) Geology I: Physiography, Dynamical and Historical Geology, by Professor Swartz. *Three lectures and one afternoon of practical work each week throughout the year.*

(b) Geology II: Mineralogy and Elementary Petrography, by Professor Swartz. *Three lectures and two afternoons of practical work each week throughout the year.*

(c) Geology III: Applied Geology, by Professor Mathews. *Three lectures each week throughout the year.*

(d) Historical Geology, by Professor Clark. *Two lectures each week throughout the year.*

(e) Dynamical Geology, by Professor Reid. *Two lectures each week throughout the year.*

(f) Petrography, by Professor Mathews. *Three lectures and two afternoons of laboratory work each week throughout the year.*

(g) Geological Field Methods, by Professor Mathews. *During spring and fall according to special appointment.*

(h) Paleontology, by Professor Berry. *Two lectures each week throughout the year.*

(i) Economic Geology, by Dr. Singewald. *Two lectures each week during the spring term.*

(j) Laboratory Work. The geological laboratory has been open daily during the year for the work of advanced students under the direction of Professor Clark, assisted by the other members of the staff.

(k) Geological Conferences, by Professor Clark. *Weekly, throughout the year.*

Original Work and Publications. Professor Clark continued his work on various phases of Maryland geology with the aid of several assistants. The results of this work appear from time to time in the current reports of the Maryland Geological Survey and in other scientific publications. He has been actively engaged in the management of the State Geological Survey and the State Weather Service, and in the supervision of the publications of these two bureaus, both of which are carried on under the auspices of the University. He is also a member of the State Board of Forestry and its Executive Officer. Professor Clark has also prepared for publication with the aid of Dr. M. W. Twitchell, a former graduate student of the department, a Memoir on the Mesozoic and Cenozoic Echinodermata of the United States which is being published as a Monograph of the U. S. Geological Survey.

Professor Reid has continued his seismological studies. He is the official American representative of the International Seismological Association and is also in charge of the earthquake records of the United States Geological Survey.

Professor Mathews has continued his investigations of the geology of the Piedmont Plateau, mapping several hundred square miles in Maryland and Pennsylvania during the past two years. In connection with the Maryland Geological Survey, Dr. Mathews, as Assistant State Geologist, has had charge of certain phases of the work and of the editing of various publications of the bureau. He has been occupied during the year in compiling a map of Baltimore and vicinity on the scale of 1000 feet to the inch, three sheets of which have been published and a fourth is in press. He has also completed a map of Hagerstown and vicinity on the same scale.

Professor Swartz has been engaged in the study of the Carboniferous formations of western Maryland and adjacent parts of Pennsylvania and in the correlation of the coal seams of those areas. Similar studies of the Silurian formations are also in progress.

Professor Berry has continued his studies of the extinct floras of the Atlantic Coastal Plain. A Monograph devoted to the Fossil Floras of South Carolina and Georgia was published during the year as Professional Paper 84 of the U. S. Geological Survey. Two other large works devoted to the Upper Cretaceous Floras of the Eastern Gulf Region and the Lower Eocene Floras of Southeastern North America are now going through the press. The elaboration of the

Upper Cretaceous floras of Maryland for the Maryland Geological Survey was completed early in the year. The work of indexing the literature of paleobotany has also made such additional progress during the year as time permitted.

Dr. Singewald has completed the study of the titaniferous iron ores of the United States, the results of which have been published as Bulletin 64 of the United States Bureau of Mines. He has also made a preliminary study of the siliceous hematite ores of Alabama to determine the possibility of utilizing these ores through the elimination of silica by subjecting them to concentration.

Dr. Gardner has been engaged during the year in monographing the prolific invertebrate faunas of the Miocene and Pliocene formations of North Carolina and Virginia. This work has been in progress now for over five years and is rapidly approaching completion. A study of the Upper Cretaceous faunas of Maryland was completed during the year.

Excursions. Numerous excursions were made with the graduate and undergraduate students into characteristic areas in the Coastal Plain, the Piedmont Plateau, and the Appalachian Region, as in former years. These excursions are regarded as an important adjunct to the classroom and laboratory work.

Scientific Societies. The fortnightly meetings of the Geological Society of Washington, as well as the meetings of the National Geographic Society, are attended from time to time during the winter by the instructors and students. By the courtesy of the Geological Society of Washington, the graduate students of this department may be elected to non-resident membership in that body.

Coöperation. Active coöperation was maintained, as in the past, with the chiefs of the National and State bureaus. The coöperation of the United States Geological Survey and also of the United States Weather Bureau has been of much importance to the work of the department.

Apparatus and Collections. Several valuable additions have been made to the apparatus and collections during the year. A large number of rare books have been purchased and the department now has one of the most complete geological libraries in this country. The library has been considerably enlarged by the gifts of books and maps. Professor Cleveland Abbe, in particular, has added many books to the meteorological library which bears his name.

WM. BULLOOK CLARK,
Director of the Geological Laboratory.

ZOOLOGY, BOTANY AND PLANT PHYSIOLOGY

The instruction and research in these three subjects have been conducted in the Biological Laboratory and in the Botanical Garden and Laboratory of Plant Physiology at Homewood.

BIOLOGICAL JOURNAL CLUB

The instructors and students in Zoology, Botany and Plant Physiology met each week for the presentation and discussion of reviews of recent literature in these three fields.

Lectures and classroom work have been conducted as follows:

I. ZOOLOGY

By Professors Jennings and Lovejoy:

Zoological Seminary. The subject dealt with this year was *Vitalism*. *Weekly, throughout the year.*

By Professor Jennings:

Heredity. *Three lectures per week, from October 1 to February 15.*

Investigations in Experimental Zoology. *Daily throughout the year.*

By Professor Andrews:

General Biology. *Nine hours a week, from Oct. 1st to March 7th.*

Embryology. *Nine hours a week from March 7th to end of session.*

By Associate Professor Grave:

Comparative Anatomy of Vertebrates and Embryology. *Nine hours a week throughout the year.*

Natural History. *Nine hours a week, from February 1st to June.*

By Associate Professor Mast:

General Physiology and Animal Behavior. *Three lectures and two laboratory periods per week throughout the year.*

Problems in Behavior. *Hours as required.*

ADVANCED WORK

In genetics the work of the zoological laboratory has been concentrated on the problems of variation and inheritance in reproduction from a single parent, since here such racial changes as play a part in organic evolution appear without the complications due to Mendelian recombinations from two parents. The simplest rhizopods were investigated from this point of view by Professor Jennings (in two species of *Diffugia*), and Mr. F. M. Root (in *Centropyxis*). Mr. A. R. Middleton made an exhaustive study of the effects of selection on the inherited fission rate in the infusorian *Stylonychia*; Miss Ruth J. Stocking studied the appearance and inheritance of certain abnormalities in *Paramecium*, and Mr. K. S. Lashley investigated variation and inheritance in *Hydra*. All these investigations are practically finished and will be ready shortly for publication.

In general physiology a number of investigations have been in progress on behavior and reactions, and on the problems of metabolism in lower organisms. Professor Mast continued his studies on the reproduction of *Didinium* and the reactions of lower organisms, and investigated the changes in pattern and color of fishes under the influence of the environment; Mr. W. L. Dolley investigated the reactions to light and heat in the butterfly *Vanessa*, and to odors in the fly *Drosophila*; and Mr. E. P. Churchill, the orientation in *Euglena* deses. Mr. Lund carried on an extensive investigation on the problems of metabolism in the infusorian *Bursaria*. Mr. Root studied the reactions to food and the reproduction in *Podophrya*.

Professor Andrews continued his studies of *Folliculina*.

Professor Grave, as a result of the unsettled condition of oyster culture in Maryland, has found it necessary to devote much of his time and energy to that matter. He continues his work in charge during the summer of the course in Invertebrate Zoology at the Marine Biological Laboratory at Wood's Hole, Mass.; in this he is assisted by Dr. E. J. Lund, Bruce Fellow.

The requirements for the Doctor's degree were absolved during the year by Messrs. W. L. Dolley, K. S. Lashley and E. J. Lund.

Dr. K. S. Lashley has been appointed Adam T. Bruce Fellow, Mr. F. M. Root and Mr. A. R. Middleton, University Fellows in Zoology. Miss Ruth J. Stocking and Mr. C. V. Lynch were appointed to occupy during the summer the two investigators' tables maintained by the University at the Marine Biological Laboratory at Woods Hole.

PUBLICATIONS IN ZOOLOGY

- Andrews, E. A.: The Bottle Animalcule *Folliculina*; Oecological Notes. *Biol. Bull.*, Vol. 26, 1914.
- Jennings, H. S.: Formulæ for the Results of Inbreeding. *American Naturalist*, Vol. 10, 1914.
- Mast, S. O.; The Value of the Ciliate, *Didinium*, in the Study of Biology. *Science*, Vol. 36, pp. 871-873.
- A Review of Yerkes' and Watson's Methods of Studying Vision in Animals. *Journ. An. Beh.*, Vol. 3, pp. 147-148.
- Loeb's Mechanistic Conception of Life. *Biol. Centb.*, Bd. 33, S. 581-593.
- Henderson's Fitness of the Environment. *Biol. Centb.*, Bd. 36, S. 434-440.
- Changes in Pattern and Color in Fishes with Special Reference to Flounders. Abstract. *Science*, vol. 38, p. 699.
- Lund, E. J.: The Relations of *Bursaria* to Food. I. Selection in Feeding and Extrusion. *Journ. Exper. Zool.*, vol. 16, pp. 1-52.
- The Relation of *Bursaria* to Food. II. *Journ. Exper. Zool.* vol. 17, pp. 1-44.
- Root, F. M.: Reproduction and Reactions to Food in the Suctorian *Podophrya* Collini, n. sp. *Archiv f. Protistenkunde*, Bd. 35, S. 164-196.

II. BOTANY

Lectures and laboratory work have been conducted as follows:

By Professor Johnson:

Reproduction and Phylogeny in Plants. For graduate students. Lectures, laboratory work and conferences. *Nine hours a week, from October 1 to June 1.*

Botanical Seminary (The Organography of Plants). For graduate students. *One hour a week, from November 1 to May 15.*

Laboratory Instruction and Direction of Research. *Daily, throughout the year.*

ADVANCED WORK

Professor Johnson continued, during the summer at the Harpswell Laboratory and during the academic year at this University, his investigations of the seed-development of the Piperaceae and of the development of flower and fruit of the Cactaceae. Part of the results of the work on the Piperaceae are embodied in a paper which appeared in the *American Journal of Botany* for July, 1914. Some of the points observed in the study of the cacti were presented in a paper read before the National Academy of Sciences, at the November meeting in Baltimore. As chairman of a committee of the Botanical Society of America Professor Johnson has written a report to be printed in *Popular Science Monthly*, of the history and present status of the Cinchona Tropical Laboratory, in Jamaica. Four different parties of investigators from this University have worked at this laboratory during the past decade and a dozen important contributions have been printed by members of the University based on work initiated there.

Grace A. Dunn carried on, at the Harpswell Laboratory during the summers of 1913 and 1914, and in this University during the past winter, a study of the development of the red seaweed *Halosaccion ramentaceum*. Some of the results of this investigation are embodied in the essay submitted by Miss Dunn in partial fulfillment of the requirements for the degree of Master of Arts, which degree was conferred on her in June, 1914.

THE BOTANICAL GARDEN

Seeds or young plants of species needed for research and for illustration in the Garden have been received during the year from the Missouri Botanical Garden, and from the garden of Lady Handbury, Ventimiglia, Italy.

Large "blanket labels," in water-proof metal cases, have been placed at the principal entrances of the Garden. These are intended to give the information needed by visitors concerning the use of the Garden and the significance of the labels. Four similar labels near the central pool show the plan of the Garden and the arrangement in it of the types of plant structure and plant activity illustrated. It is expected that these labels will make the large series of plants now growing in the Garden more interesting and intelligible to members of the University and to citizens of Baltimore.

Considerable attention is being given to the problem of securing a permanent type of label for the individual species of plants growing at Homewood. It is believed that one of three types of machines now made for stamping raised letters in zinc and aluminum can be so modified that it will produce very legible and entirely permanent species labels.

PUBLICATIONS IN BOTANY

D. S. Johnson:

The Evolution of a Botanical Problem. Address as Vice-President of the American Association for the Advancement of Science, at the Atlanta Meeting. *Science*, vol. 39, pp. 299-319, 1914. (The Secretary of the Smithsonian institution has asked permission to reprint this address in the Report of the Regents to Congress.

The Structure and Seed-Development of *Peperomia hispidula*, Part I. *American Journal of Botany*, vol. 1, pp. 323-339, July, 1914.

Forrest Shreve:

The Direct Effects of Rainfall on Hygrophilous Vegetation. *Journal of Ecology*, June, 1914. (Embodies work initiated while the writer was Bruce Fellow of this University.)

W. E. Maneval:

The Development of *Magnolia* and *Liriodendron*, Including a Discussion of the Primitiveness of the Magnoliaceae. *Botanical Gazette*, vol. 57, pp. 1-31, 1914.

G. C. Fisher:

Seed-Development in the Genus *Peperomia*. *Bull. of the Torrey Botanical Club*, vol. 41, pp. 137-156, 221-241, 1914.

III. PLANT PHYSIOLOGY

ADVANCED WORK

Professor Livingston's investigations of the physics of the water relations of plants, mentioned in previous reports, have been carried forward throughout the year, with continued financial aid from the Department of Botanical Research of the Carnegie Institution of Washington. During the summer of 1913, Mr. H. E. Pulling, Fellow in the University of Wisconsin, assisted Professor Livingston at the Desert Laboratory and carried out a first study of the ability of soils to supply water to an absorbing surface (as of plant roots), by means of a standard osmotic cell or osmometer. It appears that a suitable osmotic membrane and mounting for this sort of study has been attained, and the method promises much in connection with the very complicated and difficult problem of the water relation between plant and soil.

During the same summer, also at Tucson, Mr. John W. Shive, Fellow in Plant Physiology in this University, assisted Professor Livingston in various lines of work and made a quantitative study of the relation between the evaporating power of the air and the moisture residue of the soil at the time of permanent wilting of

plants rooted therein. From this study it appears that the relation here in question may be stated as a logarithmic function, which seems to be practically the same for a wide range of soils and plants. For each doubling of the evaporating power of the air there occurs an increase in the residual soil moisture of about 0.45 per cent., on the basis of the dry weight of the soil.

Mr. A. L. Bakke, Instructor in Plant Physiology in Iowa State College, also worked under the direction of Professor Livingston at the Desert Laboratory during the summer of 1913, making a first comparative survey of the foliar transpiring powers of many different plant forms, by means of the method of standardized hygrometric paper slips devised by Professor Livingston at the Laboratory of the Pflanzenphysiologisches Institut at Munich, in 1908.

The preparation and standardization of porous clay cups for the porous cup atmometer has continued, at Tucson and at Homewood, throughout the year, and about a thousand of these have again been furnished to experimenters in various countries.

Professor Livingston, assisted by Mrs. Grace J. Livingston and by Miss Aleita Hopping, has made considerable progress toward the solution of the problem of the spherical porous cup for atmometers. The first spheres were obtained from Germany by Professor W. L. Tower, of the University of Chicago. It is now possible to have them made in America, though the attainment of this result has involved much study and testing of submitted samples. This appears to be an important forward step in the developing of the science of atmometry.

Mr. John W. Shive has entered upon a continuation of the work done here in 1913 by Mr. W. E. Tottingham (Instructor in Plant Chemistry in the University of Wisconsin), and has made cryoscopic determinations of the several hundred four-salt solutions employed for water cultures by Mr. Tottingham. These solutions were originally calculated to have certain total diffusion tensions, or possibly osmotic pressures, and the cryoscopic tests show the calculations to have been very nearly correct. Mr. Shive has continued the experimentation on the relation between total diffusion tension and the proportions of the component salts in nutrient solutions, using buckwheat as subject. This work is planned to throw light on several important problems of plant nutrition, including the question of salt antagonism. Mr. Shive has assisted Professor Livingston in the Laboratory and has had charge of the equipment.

Mr. F. T. McLean, on leave of absence from the U. S. Forest Service, has assisted Professor Livingston in perfecting various methods for use in physiological ecology and is carrying out, for the Maryland Weather Service, a quantitative study of the relation of climatic conditions to plant growth in Maryland. The plans for this work, originally elaborated by Professor Livingston at the suggestion of Professor W. B. Clark, of the Maryland Weather Service and of this University, involve frequent observations and measurements at nine stations distributed from the Eastern Shore to the Alleghany Mountains. The work will progress throughout the summer of 1914. Acknowledgment should here be made of the cordial cooperation, in this study, of Dr. O. L. Fassig of the U. S. Weather Bureau and of this University, and of Professor W. T. L. Taliaferro, of the Maryland Agricultural College.

Mr. A. W. Sampson, on leave of absence from the U. S. Forest Service, has made a preliminary study of moisture equilibria in soils. This work will be continued.

Miss Aleita Hopping has studied the water-absorbing power of a number of soil mixtures and has assisted in the experimental studies of Professor Livingston in many ways.

THE LABORATORY OF PLANT PHYSIOLOGY

To the equipment of the Laboratory of Plant Physiology various additions have been made during the year. Especially to be noted are several electrically-rotated tables for use in plant cultures, by means of which a number of uncontrolled environmental conditions are made equally effective upon the several cultures of a series. The employment of a janitor and helper, authorized in May, 1913, has added markedly to the comfort and cleanliness of the building and to the efficiency of the work. Professor Livingston's private collection of separate reprints bearing on plant physiology and related subjects has been catalogued and arranged in a vertical filing system, and is available for the use of students.

PUBLICATIONS IN PLANT PHYSIOLOGY

B. E. Livingston:

Reviews: Findlay's "Osmotic Pressure" (*Plant World*, 16: 234-6, 1913); Ganong's "The Living Plant" (*Science*, N. S. 38: 481-4, 1913); Henderson's "Fitness of the Environment" (*Plant World*, 16: 315-8, 1913); Britton and Brown's "Illustrated Flora" (*Bull. Am. Geog. Soc.* 46: 56-8, 1914); Adams' "Guide to the Study of Animal Ecology" (*Plant World*, 17: 161-3, 1914); Bose's "Researches on the Irritability of Plants" (*Science*, N. S. 39: 511-3, 1914).

B. E. Livingston and Grace J. Livingston:

Temperature coefficients in plant geography and climatology. *Bot. Gaz.*, 56: 349-75. 1913.

J. W. Shive and B. E. Livingston:

The relation of atmospheric evaporating power to soil moisture content at permanent wilting in plants. *Plant World*, 17: 81-121. 1914.

W. E. Tottingham:

A quantitative chemical and physiological study of nutriment solutions for plant cultures. *Physiol. Res.* 1: 133-245. 1914.

HERBERT S. JENNINGS,
Henry Walters Professor of Zoology.

DUNCAN S. JOHNSON,
Professor of Botany.

BURTON E. LIVINGSTON,
Professor of Plant Physiology.

ANIMAL PHYSIOLOGY

The courses in animal physiology were given during the past session in accordance with the announcements in the published schedules, as follows:

1. A lecture course extending through the academic year and covering in a systematic way the whole field of animal physiology. The lectures in this course were given by Professor Howell during the fall and winter trimesters, by Associate Professor Hooker during the spring trimester, and in part by Associate Professor Snyder during the winter trimester.

2. Two laboratory courses, each comprising 130 hours of work. One of these courses was given during the fall trimester, the other during the spring trimester. In each case the section was divided into four sub-groups each under the charge of an instructor. All of the physiological staff, Drs. Howell, Hooker, Snyder, and Davis, participated in this work. In addition to these courses instituted primarily for the students of the first and second years of the medical department, a number of students sought and obtained permission to pursue special studies under the direction of one or the other members of the staff. As in former years a journal club in physiology met weekly for the presentation and discussion of current investigations in physiology and the allied sciences. Some of the instructors in the departments of pathology, physiological chemistry, pharmacology and anatomy took part in the meetings of this club.

Investigations have been in progress during the year by all the members of the staff and by special students working under their supervision. Some of these researches have been published, others will be continued during the next session. The scientific publications from the department during the year are as follows:

The condition of the blood in Hemophilia, Thrombosis and Purpura, by William H. Howell. *Archives of Internal Medicine*, 1914, XIII, p. 76.

The clotting of blood as seen with the ultramicroscope, by W. H. Howell. *American Journal of Physiology*, 1914, XXXV, 143.

Prothrombin, by W. H. Howell. *American Journal of Physiology*, 1914, XXXV.

The coagulation of Lymph, by W. H. Howell. *American Journal of Physiology*, 1914, XXXV.

Engenics as viewed by the Physiologist, by W. H. Howell. In *Eugenics—Twelve University Lectures*, 1914. Dodd, Mead and Co.

The medical school as part of the University, by W. H. Howell. In *Medical Research and Education*, 1913. The Science Press, New York.

The effect of filtration through a Berkefeld filter upon the coagulability of oxalated plasma, by C. H. Goddard. *American Journal of Physiology*, 1914, XXXV, p. 333.

Observations on the venous Blood-pressure in Man, by D. R. Hooker. *American Journal of Physiology*, 1914, XXXV, p. 73.

Interpretation of the auscultatory blood-pressure Sounds, by D. R. Hooker and J. D. Southworth. *Archives of Internal Medicine*, 1914, XIII, p. 384.

The vascular tone and the distribution of the Blood in surgical Shock, by R. A. Morrison and D. R. Hooker. In press.

Is the Contraction of Smooth Muscle accompanied by Heat Production? by C. D. Snyder. *American Journal of Physiology*, 1914, XXXV, p. 340.

WILLIAM H. HOWELL,
Professor of Physiology.

GREEK

Under the direction of Professor Gildersleeve the advanced students of Greek have been organized into a Greek Seminary. According to the plan of the Seminary the work of each year is concentrated on some leading author or some special department of literature. During the past year the centre of work was Plato and the Literary form of Greek Philosophy, and the members, who met twice a week as a Seminary, were required to present in turn exegetical and critical commentaries on select dialogues, to make analyses of the same, and to prepare introductory lectures and papers on special points. The work of the Seminary was accompanied by a course of reading in Plato.

Besides the Seminary course proper, Professor Gildersleeve conducted a series of twenty-three practical exercises in the study of Greek Idiom, and held twelve conferences on the Theory of the Cases.

Professor Robinson conducted readings once a week throughout the year in the Republic of Plato.

Professor Miller lectured once a week throughout the year upon the History of Greek Philosophy; conducted weekly readings in Aristotle's Nicomachean Ethics and Politics throughout the year; and gave a course in prose composition with weekly meetings from February 1 to the end of the year.

Dr. Bolling gave during the second half of the session a series of twelve lectures upon the Homeric Question.

Undergraduate courses were conducted as follows:

Professor Robinson:

History of Greek Literature. *One hour weekly, through the year.*

Associate Professor Spieker:

Lysias, VII, XII; Prose Composition. *Three hours weekly, first half-year.*

St. Luke. *Two hours weekly, first half-year.*

Benner-Smyth's *Beginner's Greek Book*: Xenophon, *Anabasis* I, *Three hours weekly, first half-year.* (During the second half-year the class was conducted by Professor Miller.)

Homer, *Iliad* I, II. *One hour weekly, first half-year.*

Professor Robinson and Associate Professor Miller:

Isocrates (selections); Euripides, *Alcestis*; Prose Composition. *Three hours weekly, second half-year.*

Associate Professor Miller:

Xenophon, *Memorabilia* (selections); Plato, *Apology*; Herodotus (selections); Prose Composition. *Four hours weekly, through the year.*

Aristophanes, *Frogs*. *Two hours weekly, second half-year.*

Benner-Smyth and Anabasis (see above).

Undergraduates have read privately for examination the following:

Aeschylus, *Prometheus*.

Elegiac Poets (selections).

Demosthenes, LIV, LV.

Euripides, *Bacchae*.

Plato, *Crito*.

Homer, *Odyssey* (one book).

B. L. GILDERSLEEVE,

Francis White Professor of Greek.

LATIN

The Seminary, which is the most important organ of graduate instruction, consists of the director, fellows, scholars, and such graduate students, as have given satisfactory proof of their ability and training. Each year special attention is given to some leading department of the literature. During the session just completed the centre of work has been the Roman Historians, more especially Livy and Tacitus. The members prepared papers founded upon various special investigations and presented in turn critical and exegetical commentaries upon given passages of those authors. The work of the Seminary was supplemented by a course of lectures on Livy and Tacitus given by the Director, Professor Smith.

In addition to the Seminary course and the auxiliary work, Professor Smith lectured on the Roman Historians and on Historical Latin Syntax each once a week through the year. He also lectured once a week through the year on Apollonius of Rhodes and the Roman Epic. This course was given in the afternoon for the benefit of teachers. During the second half-year he also gave fourteen lectures on the development of the Greek and Roman Hexameter.

Professor Mustard lectured once a week through the year on Didactic Poetry.

Undergraduate courses were given as follows:

Professor Smith:

History of Roman Literature (lectures and readings). *Weekly, through the year.*

Tibullus (Selections), Ovid (Selections), Juvenal. *Two hours weekly, through the year.*

Collegiate Professor Mustard:

Latin II: Tacitus, *Annals*, bk. I; Pliny, *Epistles*, bk. VI; Horace, *Odes and Epodes*. (Private Reading: Tacitus, *Germania*.)
Three hours weekly, through the year.

Latin I: Livy (Selections); Terence, *Phormio*; Vergil, *Fourth Georgic*; Horace, *Selected Odes*. (Private Reading: Vergil, *Aeneid*, bk. VIII.) *Three hours weekly, through the year.*

Latin Composition. *Weekly, through the year.*

Under the arrangements for College Courses for Teachers, Professor Mustard repeated the course described as Latin I. *Three hours weekly, through the year.*

KIRBY FLOWER SMITH,

Professor of Latin.

WILFRED P. MUSTARD,

Collegiate Professor of Latin.

CLASSICAL ARCHAEOLOGY AND ART

The work in Classical Archaeology and Art has been carried on by means of the Archaeological Seminary, various courses of lectures and practical exercises, demonstrations in the museum of the University, and especially by means of daily conferences with individual students. The members of the Seminary, meeting weekly, devoted their attention to Greek and Roman Sculpture; and papers were presented from time to time on topics previously arranged.

In addition to his direction of the Seminary for the year, Professor Robinson lectured once a week through the year on Greek Inscriptions, and once a week on Greek Vases and Mythology. In the Greek department Professor Robinson gave a course on Plato's *Republic*. He also lectured once a week on the History of Greek Literature.

Dr. Magoffin lectured once a week on Latin Epigraphy, and conducted an undergraduate course on Roman Private Life.

Lectures were given before the Archaeological Society by Mrs. Arthur Strong, Professors Rand and Tonks, Mr. Johnson, and Dr. Magoffin.

DAVID M. ROBINSON,

Professor of Classical Archaeology and Greek Epigraphy.

SANSKRIT AND COMPARATIVE PHILOLOGY

During the session of 1913-14 the advanced work in Hindu Philology was carried on under two distinctive heads:

First, the Vedic Seminary was engaged in the study of the oldest literary document of India, the Rig-Veda. It began by reading continuously part of the first book, as an exhibit of the arrangement of the Rig-Veda and the redactorial habits of its compilers. Then followed selections from the mass of 1000 hymns designed to illus-

trate best the religious and literary character of the collection. The tradition of the Seminary favors independent handling of these difficult materials. As has been the case in preceding years, the interpretation of certain hymns led to results which it is hoped mark advance in this line of study. Professor Bloomfield's laborious work on 'Rig-Veda Repetitions' is now going through the press as one of the volumes of the Harvard Oriental Series.

A second line of advanced work concerned itself with Buddhism and Buddhist literature. The great canon of the so-called 'Birth-Stories' (Jātakas), a collection of moralizing fables and fairy-tales, was studied in the light of parallel Brahmanical and Jainistic literature. The Jātakas, on the one hand, show the practical working out of the Buddhist morality; on the other hand the unrivaled story-telling instinct of the Hindus manifests itself in this collection in one of its most brilliant aspects. Professor Bloomfield read before the American Philosophical Society in Philadelphia a paper, in the nature of a program for the systematic study of Hindu Fiction, entitled, 'On repeated psychic motifs or traits in Hindu Fiction.' This was followed by a second paper read before the Johns Hopkins University Philological Association on, 'The laugh and cry motifs in Hindu Fiction.' He has also in the press an article 'On talking birds in Hindu Fiction.'

The work in the Veda was supported by a course in the Avestan (Ancient Persian) language and literature. This is, at the same time, an important phase in the study of Indo-European Comparative Grammar. After an introduction into the grammar of the language, a considerable number of selected portions of the Avesta were read, analyzed, and compared with the closely related language and literature of the Veda.

The work in Comparative Philology was two-fold. First, a course of lectures on General Comparative Philology. This began with a definition of the theme and its relation to History, followed by a brief sketch of the history of the science. The bulk of the lectures dealt with the linguistic Ethnology of the Indo-European peoples, their divisions, special inter-relations, and their original home (the so-called Aryan question). This was followed by sketches of the individual peoples of the family: India, the Vedas, Brahmanism, Sanskrit Literature, and Buddhism; Persia, the Achaemenidan cuneiform inscriptions, the Zoroastrian Literature (Avesta) and religion; the minor and problematic Indo-European peoples; and finally, ethnological sketches of the European peoples and their national religions.

Professor Bloomfield has published recently in the *American Historical Review*, a critique of 'Feist's Kultur, Ausbreitung, und Herkunft der Indo-Germanen.'

A second course, in the Comparative Grammar of the Indo-European languages, treated the history of the vowels and their 'ablaut' relations, with particular reference to Greek, Latin, Teutonic, and Sanskrit. This was preceded by a series of conferences on the phonetics of the vowels. A corresponding course on the history of the consonants is offered during the session of 1914-15.

MAURICE BLOOMFIELD,
Professor of Sanskrit and Comparative Philology.

ORIENTAL SEMINARY

In the Oriental Seminary, under the direction of Professor Haupt, thirty-three courses in the various departments of Oriental research were given during the past year, special attention being paid to the Old Testament and the cuneiform inscriptions bearing on the Scriptures.

Twenty-three hours, through the year, were devoted to the study of *Hebrew and the Old Testament*. In the *Old Testament Seminary*, two hours weekly, through the week, Professor Haupt interpreted, during the first half-year, Psalms 72 and 114, and the Songs of the Return, Psalms 120-134, also the Song of Deborah in Judges, Chapter V, and during the second half-year he gave a critical explanation of the Books of Haggai and Obadiah. He also gave a course of lectures on the *History of the Maccabean Period*, supplemented by the interpretation of selected *Maccabean Psalms*, during the first half-year, and conducted, through the year, a series of weekly exercises in *Hebrew Prose Composition*, the students translating idiomatic English sentences into Hebrew. During the second half-year he conducted a course in *Comparative Hebrew Grammar*, paying special attention to the structure of the verb. Dr. Rosenau met a class, through the year, for the reading of *Unpointed Hebrew Texts*; he also conducted, through the year, courses in *Cursory Reading of the Hebrew Bible*, and in *Post-Biblical Hebrew*, besides giving the *Third Year's Course in Hebrew*, two hours weekly, through the year. Dr. Blake gave a series of lectures on *Hebrew Phonology*, preceded by a brief exposition of the elements of Phonetics, through the year, and conducted a course in *Hebrew Grammar*, through the year, with special reference to the morphology of the verb. The instruction in *Elementary Hebrew* was given in two classes, *viz.*, course A by Dr. Ember, two hours weekly, through the year; course B, by Dr. Schick, three hours weekly, through the year. Dr. Ember also gave the course in *Second Year's Hebrew*, two hours weekly, through the year, and conducted a series of weekly exercises in *Hebrew Conversation*, through the year.

Dr. Blake gave a course, through the year, in *Aramaic Grammar and Interpretation of the Aramaic Portions of the Book of Daniel*. The lectures on the *History of the Ancient East* (Egypt, Babylonia, Assyria, Persia, Israel and Judah), were given by Dr. Blake, through the year, while Dr. Schick gave two series of lectures, both through the year, on *Biblical Archaeology*, and on the *Literature of the Old Testament* with special reference to date and authorship.

In *Syriac*, an elementary course was given, by Dr. Blake, selections being read from the Book of Genesis.

In *Arabic*, Professor Haupt conducted weekly exercises in *Arabic Prose Composition*. The instruction in *Elementary Arabic* was given by Dr. Schick, two hours weekly, through the year, while Dr. Ember conducted courses in *Selected Arabic Prose Writers* (Fischer's Chrestomathy), two hours weekly, through the year, as well as in *Selections from the Arabian Nights*, during the first half-year, and *Selections from the Koran*, during the second.

In *Ethiopic* an elementary course was given by Dr. Blake, through the year.

Five hours, through the year, were devoted to the study of *Assyriology*. Professor Haupt gave, through the year, a course in *Comparative Assyrian Grammar*, supplemented by the interpretation of selected texts, besides conducting weekly exercises in *Assyrian Prose Composition*, the students translating from Arabic into cuneiform. Dr. Schick gave courses in *Elementary Assyrian*, two hours weekly, through the year, as well as in *Assyrian Historical Inscriptions* and *Old Babylonian Texts*, both weekly through the year.

In *Egyptology*, Dr. Ember conducted courses in *Egyptian for Beginners*, *Pyramid Texts*, *Hieratic Texts*, and *Advanced Coptic*, each weekly through the year.

Professor W. G. Seiple, of Sendai, Japan, conducted, weekly through the year, a course in Japanese.

The instructors of the Oriental Seminary met weekly, through the year, to present new discoveries, and report on important articles in the leading Semitic journals.

At the meeting of the American Oriental Society, held at Boston and Cambridge, April 16 and 17, Professor Haupt delivered the presidential address on *Armageddon*. He also read two other papers: (a) The Sumerian names of Egypt and Nubia (cf. OZ 16, 488-492); (b) Some Assyrian Etymologies. Dr. Blake presented a paper on the apparent interchange between *He* and *Aleph* in Semitic, and Dr. Ember presented three papers: (a) Are the Apurii of the Egyptian inscriptions identical with the Hebrews? (b) The phonetic values of the signs for 'hand' and 'bolt' in the Egyptian alphabet; (c) Hermapion's translation of an Egyptian obelisk in Ammianus Marcellinus.

At the meetings of the University Philological Association the following papers were read by members of the Oriental Seminary: Professor Haupt (October 17, 1913): Sea-traffic between Babylonia and Egypt about 2500 B. C. (abstract in OZ, November, 1913). Dr. Ember (November 21): Corrected values of several Egyptian alphabetic signs. Dr. Schick (March 20): Cuneiform Chemical Formulae.

At the annual meeting of the Society of Biblical Literature, held in New York City, December 28 and 29, Professor Haupt read the following papers: (a) The oldest monument of Hebrew literature; (b) The inauguration of the Second Temple; (c) The ancient Egyptian names of Palestine.

At the general meeting of the American Philosophical Society, held in Philadelphia, April 25, Professor Haupt read a paper on Some Biblical Miracles.

Professor Haupt published four papers in the *Orientalische Literatur-Zeitung*, vol. xvi, cols. 488-494 and 529-533 (Nov. and Dec., 1913): (a) Magan and Melukha; (b) Assyrian *daggasse*, mineral pigments; (c) Assyrian *kabtu adl arba'isu*, most valuable; (d) The form of the Assyrian ordinal numbers. He also published the following articles:—An Ancient Hebrew Poem (Joel's poem on the Locusts) in *The Boston Jewish Voice*, Nov. 14 and 28, 1913;—On the ancient prayer concealed in the last nine proper names given in I Chron., xxv, 4, in *Zeitschrift für die alttestamentliche Wissenschaft*, vol. xxxiv, part 2 (Giessen, 1914);—The Battle of Taanach

in the Memorial Volume published in honor of the 70th anniversary of Julius Wellhausen (Giessen 1914);—On the Babylonian names of the months in the *Journal of Biblical Literature*, vol. xxxii, part 4, pp. 273-4 (Dec., 1913).

Dr. Blake's article on the Expression of Indefinite Pronominal Ideas in Hebrew was published in the *Journal of the American Oriental Society*, vol. xxxiv, pp. 115-228. Dr. Ember's article on Several Semito-Egyptian Particles appeared in the *Zeitschrift für Assyriologie*, Bd. xxviii (1913), pp. 302-306; he also published an article on Kindred Semito-Egyptian Words (New Series) in *Zeitschrift für Ägyptische Sprache und Altertumskunde*, vol. li, parts 1 and 2 (1914), pp. 110-121; and a note on Mehri parallels to Egyptian stems with prefixed *h*, in the same volume, p. 138 f. Dr. Schick's article on The Stems *dām* and *damām* in Hebrew, appeared in the *Journal of Biblical Literature*, vol. xxxii, pp. 219-243.

The second part of vol. ix (626 pp.) of the *Contributions to Assyriology and Comparative Semitic Grammar*, edited with the coöperation of the Johns Hopkins University, by Professor Paul Haupt in conjunction with Professor Friedrich Delitzsch, of Berlin, containing the second part of Professor Geo. A. Barton's work on *The Origin and Development of Babylonian Writing* was issued in December, 1913.

Dr. Shosuke Sato, Dean of the College of Agriculture of the Tohoku Imperial University, Sapporo, gave a course of six lectures on The Fifty-years Progress of Japan (January 26–February 6), viz., (1) From Old Feudalism to New Imperialism (Jan. 26); (2) Social Changes and Reforms since the Restoration (Jan. 28); (3) Local Autonomy and Constitutional Government (Jan. 30); (4) Agricultural Credit and Rural Sociology (Feb. 2); (5) The Educational System and Religious Movements (Feb. 3); (6) A Comparative Economic Retrospect of Agriculture in Great Britain and Japan (Feb. 6).

Professor C. Snouck Hurgronje, of the University of Leyden, gave four lectures on *Islam* in February, viz., (1) The Origin of Islam (Feb. 10); (2) Religious Development of Islam (Feb. 11); (3) Political Development of Islam (Feb. 17); (4) Islam and Modern Thought (Feb. 18).

The Library, under the charge of Dr. Ember, was enriched by a number of important additions in the various branches of Oriental research.

PAUL HAUPT,

W. W. Spence Professor of Semitic Languages
and Director of the Oriental Seminary.

ENGLISH

1. Advanced Courses.

The advanced students of English are organized into an English Seminary, which is conducted by Professor Bright. Graduate students are admitted to the Seminary as soon as they have satisfied initial requirements for independent research. The discipline of the Seminary is designed to impart training in scholarly methods of dealing with literary and linguistic problems. Study and investigation are bestowed upon selected periods of literary history, upon departments of literature extending through successive periods, and upon the works of important writers, separately or in groups. Usually there is a change of subject each half-year.

During the academic year 1913-1914, the sessions of the Seminary occupied four hours a week. The works of the following eighteenth century writers were studied: Anne, Countess of Winchilsea; Thomas Parnell; John Dyer; James Grainger; William Falconer; John Armstrong; Edward Young; Mark Akenside; James Hervey; James Beattie; Allan Ramsay; William Somerville; William Shenstone; Richard Savage; Charles Churchill; John Wolecot; Thomas Gray; Joseph Warton; Thomas Warton. This course was in continuation of that of the preceding academic year, and the members of the Seminary were again assisted in the study of the philosophic thought of the period by attendance on the concurrent lectures of Professor Lovejoy.

Professor Bright met a class once a week for a study of the so-called Alfredian translations of Latin works into Anglo-Saxon.

He also lectured once a week on the more technical aspects of the relation of Anglo-Saxon vowels and consonants to the Germanic and the Indo-Germanic systems of sounds.

Professor Bright conducted a class (two hours a week) in Anglo-Saxon.

The Journal Club of the Seminary was conducted by Professor Bright. Sessions of two hours on alternate Fridays were held for reports of the current linguistic and literary periodicals.

2. College Courses.

A class in Rhetoric and English Composition (English Composition 1) met in three sections, three times a week, throughout the year. Dr. French taught Section A and Dr. Myers, Sections B and C. Mr. H. G. Du Bois assisted in theme-reading for the three sections. The work of the course included, besides the study of the principles of prose composition, the regular writing of themes and essays, the reading month by month of certain prescribed works in prose and verse, and on the more important of the essays private conferences with the instructors. James W. Linn's *The Essentials of English Composition* was used as a text-book and G. H. Palmer's *Self Cultivation in English*, as a source of illustrative material.

Dr. Myers conducted, once a week, a class in English Composition (English Composition 2), prescribed for all students in their second year, unless absolved by attaining a grade of "8" in English Composition 1. The principles of sentence-structure and of diction were

reviewed, and practice in writing was afforded by weekly themes, criticised in class. The text-book used was J. W. Linn's *Essentials of English Composition*.

Dr. French gave an elective course, three hours a week throughout the year, in the Forms of Public Address. The current numbers of the *Atlantic Monthly* were used as a source of essays selected for study and criticism. The work of the course included much practice in oral English and involved the consideration in turn of exposition, argumentation, and persuasion. Various great American debates were examined, stress being laid on the Lincoln-Douglas debates of 1858. The course is known as English Composition 4.

English Literature 1 (prescribed for students in Arts and Sciences) was conducted by Professor Greene three times a week, throughout the year. This class made a general survey of English Literature from the beginning until about 1625. A considerable amount of the poetry of Chaucer and of Shakspeare was studied critically in the class-room, and more was read by the members of the class in their private reading: Books xviii-xxi of Sir Thomas Malory's *Morte Darthur* and Book II of Sir Thomas More's *Utopia* were also included in the private reading. In addition to the regular class-room exercises, five readings from the poems of Chaucer and nine lectures upon the dramas of Shakspeare were given for the benefit of those members of the class who wished to attend them.

English Literature 2 (elective) was given by Professor Greene, three hours a week, throughout the year. During the first half-year a careful study was made of the minor poems of Milton and of Book I of *Paradise Lost*; Books II-IV were read by the members of the class in their private reading. The second half-year was spent in the study (a) of English forms of verse, (b) of the writings of Dryden and Pope, and (c) of the history of the English Bible, and of some of the literary features of the Bible.

English Literature 3 (elective) was given by Professor Greene, three hours a week, throughout the year. During the first term a study was made of the English and Scottish Popular Ballads, and of the poems of Burns and Scott. During the remainder of the year the course included a study of poetry as represented in the writings of Wordsworth, Coleridge, Byron, Keats, and Shelley, and of the novel as represented in the writings of Scott and Dickens. In connection with the weekly lectures and discussions the members of the class did a large amount of private reading, and prepared seven papers.

English Literature 5 (prescribed for technological students) was conducted by Dr. Myers, three times a week, throughout the year. The course included a general survey of English literature from the beginning to about 1824. Especial emphasis was laid upon the works of certain authors (such as Chaucer, Spenser, Shakspeare, and Milton) and upon the development of certain types of literature (such as the drama and the novel). Moody and Lovett's *History of English Literature* was used as a manual, and Newcomer-Andrews' *Twelve Centuries of English Poetry and Prose* as a source of illustrative texts.

English Literature 8 (elective) was given by Professor Greene, twice a week, throughout the year. The tragedy of *Hamlet* was the

principal subject of the year's study. This included a careful interpretation of the text, a consideration of the principal features in the early editions of the play, of the relation of Shakspeare's tragedy to the contemporary revenge plays and to the Senecan tragedy of Kyd, and the problems presented by Shakspeare's *Hamlet* as interpreted in the light of these studies. Three papers, based upon the investigation of special topics, were presented by the members of the class.

Attention was also given to the structure of Elizabethan play-houses, to the Elizabethan and Jacobean manner of staging and presenting plays, and to the effect of the structure of theatre and stage upon dramatic technique.

A course in reading and public speaking (Public Speaking 1), one hour a week, was conducted by Dr. French. The class was divided into six sections of about ten members each. After a brief survey of the principles of expression, various types of the occasional speech were considered in succession. Excerpts from selected speeches were delivered from memory, and original speeches of a similar character were then attempted. Practice in extemporaneous speaking was obtained in the last term. Knapp and French's *The Speech for Special Occasions* was used as a text-book.

A course in Debate (Public Speaking 2) was given by Dr. French, once a week, throughout the year. The course included lectures on argumentation, written briefs and forensics, class debates, and six lectures on parliamentary procedure. Gardiner's *The Making of Arguments* and Robert's *Rules of Order* were used as text-books.

The "Adams Contest," held on March 13, afforded additional practice in public speaking and debate. Contestants for the Adams medal, chosen from the class of 1916 by a preliminary contest, and members of the debating teams of the classes of 1914 and 1915, selected by the instructor after competitive tests, were trained in delivery. The Adams medal for public speaking was won by Mr. Thomas J. Tingley. The Adams trophy for debating was awarded to the class of 1914. For the second time, a triangular inter-university debate, involving the University of Virginia, the University of North Carolina, and the Johns Hopkins University, was held, the contests taking place April 18. Johns Hopkins won first place in the league, securing the votes of all five judges in the debate with Virginia and four out of five against North Carolina. On March 27 the annual oratorical contest of the colleges of Maryland and the District of Columbia, for a prize offered through the Inter-collegiate Peace Association by the Maryland Peace Society, was held in McCoy Hall. The prize was won by the representative of Loyola College, Mr. Jerome J. Joyce, Jr.

3. College Courses for Teachers.

A course for teachers which was designed to cover practically the same ground as the college course in English Composition 1 was given by Dr. Myers. The class met twice a week from October 14 to May 28. Linn's *Essentials of English Composition* and Palmer's *Self Cultivation in English* were used.

An advanced course in English Composition was given by Dr. French. The class met twice a week from October 14 to May 28.

The current numbers of the *Atlantic Monthly* were used as a source of illustrative material and for parallel reading. No text-book was used.

A course in English Literature of the Age of Dryden and Pope (1660-1780) was given, twice a week, by Associate Professor Gay of Goucher College.

4. Public Lectures.

Professor George Lyman Kittredge, of Harvard University, delivered (April 27 to May 8, 1914) the nineteenth course of The Percy Turnbull Memorial Lectures on Poetry. This course consisted of six lectures on the poetry of Chaucer: (1) The Times and the Man; (2) The Book of the Duchess; (3) The House of Fame; (4) Troilus; (5 and 6) The Canterbury Tales.

JAMES WILSON BRIGHT,
Caroline Donovan Professor
of English Literature.

GERMAN

The German Seminary, meeting three times weekly through the year, was conducted by Professor Wood. The work of the Seminary was equally divided between German literature of the Eighteenth century and the Courtly Epic of the Middle High German period. The subject for the first half-year was "Storm and Stress" in German Literature (1772-1785). During the second half-year the *Parzival* of Wolfram von Eschenbach was studied.

The Germanic Society, which is directed by Professors Wood and Collitz, is composed of the instructors and graduate students in German. Five meetings were held during the year, and the following papers were read: A. L. T. Starck, The Mandrake as a Charm and Specific before 1000 A. D., Some Notes on the Mandrake in German Literature; Sara Porter, Anaptyctic Vowels in the Heliand, Timm Kroeger; Professor Wood, Bettina von Arnim.

Professor Wood gave the following graduate courses:

1. Goethe's Later Dramas. Two hours weekly, first half-year. Goethe's plays with typical characters, beginning with the period of the French Revolution (*Natürliche Tochter*, *Fragment einer Tragödie*, *Pandora*) were studied, as representing an important stage in the development of German classicism.

2. German Literature in the Seventeenth Century. Two hours weekly, second half-year.

The literary reform in Germany in the first quarter of the century was considered in detail, and the old and new metrical canons were studied and compared, on the basis of Opitz, *Buch der deutschen Poeterei*. The same author's longer poem *Zlatna, oder von Ruhe des Gemüts* was examined, and a new position for Opitz as humanistic regenerator of the form and spirit of Late Latin poetry was claimed. The chief results arrived at were presented by Professor Wood in a paper read before the University Philological Association in May, 1914.

Professor Wood also conducted an undergraduate course, twice weekly, through the year, in Goethe's *Faust* and in the same author's *Iphigenie* and *Götz von Berlichingen*, and a Teachers' course, twice weekly through the year, on German Drama in the Nineteenth Century. Witkowski, *Das deutsche Drama des neunzehnten Jahrhunderts* was studied, and the following plays were read in class: Heinrich von Kleist, *Prinz Friedrich von Homburg*, Robert Guiscard, *Das Kütchen von Heilbronn*; Grillparzer, *König Ottokars Glück und Ende*, *Des Meeres und der Liebe Wellen*; Hebbel, *Herodes und Mariamne*, *Gyges Ring*; Ludwig, *Der Erbförster*.

The Germanic Seminary, meeting twice weekly, was conducted by Professor Collitz. In continuation of the study of Low German documents, carried on during the preceding half-year, the sources of the Old-Frisian language—the connecting link between Low-German and English—were made the basis for critical reading and interpretation. In the second half-year the time of the seminary was divided between the study of Frisian and that of selections from some of the earliest Old-High German texts, viz., the O. H. G. Isidor and the Rule of St. Benedict.

The following graduate courses were given by Professor Collitz:

1. Old High German. Weekly, first half-year. O. H. G. grammar was studied in its essential features with the aid of Braune's *Abriß der ahd. Grammatik*. O. H. G. texts, selected from Braune's *Ahd. Lesebuch* were read in connection with the study of the grammar. This course served as a preparation for the interpretation of O. H. G. texts in the second half-year of the Germanic Seminary.

2. Old Norse. Weekly through the year. A course for beginners in Old Norse, embodying the elements of O. Norse grammar and practice in reading easy Icelandic texts. Sweet's Icelandic Primer served as a text-book. Towards the end of the second half-year the students read selections from the Poetic *Edda*, namely the *Thrymskvitha* and the *Voluspa*.

3. German dialects. The course was chiefly concerned with the Low German dialects of the present time. Selections from Fritz Reuter, Klaus Groth and F. W. Grimme were read, so as to illustrate the great difference existing between the dialects spoken in the various parts of the Low German territory.

Associate Professor Kurrelmeyer gave the following graduate courses:

1. Middle High German (Introductory Course). Two hours weekly, first half-year. After a brief survey of the essentials of Middle High German Grammar, with the aid of Paul's *Mittelhochdeutsche Grammatik*, Hartmann von Aue's *Armer Heinrich* was read. This was followed by selections from Bachmann's *Mittelhochdeutsches Lesebuch*.

2. Wieland's *Goldner Spiegel*. One hour weekly, second half-year. After a brief presentation of the purpose of the *Goldner Spiegel*, and its influence upon Wieland's literary career, the development of the text was studied from the point of view of textual criticism.

Associate Professor Kurrelmeyer also gave the following undergraduate and special courses:

Elementary German. Four hours weekly. Vos, *Essentials of*

German; Whitney and Stroebe, *Easy German Prose Composition*; Gerstäcker, *Germelshausen*; von Wildenbruch, *Das edle Blut*; Heyse, *Die Blinden*.

German 4. Contemporary Literature in rapid readings. Three hours weekly. Grillparzer, *Sappho*; Ludwig, *Der Erbfürster*; Heibel, *Herodes und Mariamne*; Agnes Bernauer; von Wildenbruch, *Der Letzte*; Keller, *Romeo und Julia auf dem Dorfe*; Sudermann, *Frau Sorge*; Meyer, *Das Amulett*.

Scientific German. Two hours weekly. Lassar-Cohn, *Die Chemie im täglichen Leben*; Walther, *Allgemeine Meereskunde*; von Helmholtz, *Populäre Vorträge*.

Historical German. Two hours weekly. Loening and Arndt, *Deutsche Wirtschaft*; Schiller, *Geschichte des dreissigjährigen Krieges*, Book III; Freytag, *Doktor Luther*.

Dr. Roulston gave the following courses:

German 1. Modern Prose Readings. Three hours weekly.

Section A—Jensen, *Die braune Erica*; Arnold, *Einst im Mai*; Sudermann, *Frau Sorge*; Keller, *Romeo und Julia auf dem Dorfe*; Eichendorff, *Aus dem Leben eines Taugenichts*.

Section B—Jensen, *Die braune Erica*; Heyse, *Vetter Gabriel*; Grillparzer, *Der arme Spielmann*; Keller, *Die drei gerechten Kammacher*; Storm, *Der Schimmelreiter*. Prose Composition: Sections A, B, and C. One hour weekly. Pope, *German Composition*; Ball, *German Drill Book*. Private Reading: Sections A, B, and C. Arnold, *Fritz auf Ferien*; Storm, *Psyche*.

German 2. Goethe and Schiller. Two hours weekly. Lessing, *Emilia Galotti*; Goethe, *Hermann und Dorothea*; Schiller, *Jungfrau von Orleans*. Prose Composition: One hour weekly. Whitney and Stroebe, *Advanced German Composition*; Exercises based on *Hermann und Dorothea*. Private Reading. Goethe, *Gedichte* (ed. Goebel).

German 3. History of German Literature (1700-1832). One hour weekly. Priest, *History of German Literature*; *The Oxford Book of German Verse*.

Teachers' Course. German 2. Three hours weekly. Storm, *Immensee*, and Prose Composition based on the text of *Immensee*; Wildenbruch, *Der Letzte*; Spielhagen, *Das Skelett im Hause*; Keller, *Kleider machen Leute*. Private Reading. Arnold, *Fritz auf Ferien*.

Mr. A. L. T. Starck conducted Section C of German 1. Modern Prose Readings. Two hours weekly. Jensen, *Die braune Erica*; Arnold, *Einst im Mai*; Sudermann, *Frau Sorge*; Keller, *Romeo und Julia auf dem Dorfe*; Storm, *Der Schimmelreiter*.

Mr. Julius Hofmann conducted a class of graduate students, two hours weekly, for Oral Practice in German.

HENRY WOOD,
Professor of German.

ROMANCE LANGUAGES

1. Graduate Courses.

Professor Armstrong conducted courses in the history of the French language as follows: Pronunciation of French, weekly; History of Sounds and Inflections, two hours weekly; Historical Syntax, weekly; Gallic Folk Latin, weekly. He also gave a weekly course in the interpretation of Old French texts.

Professor Marden conducted courses on the Spanish Drama before Lope de Vega, weekly, in Old Spanish Readings, weekly, and on the Sources of Romance Bibliography, six lectures.

Professor Brush conducted a weekly course on French Romanticism and Realism.

Associate Professor Shaw conducted courses in the Interpretation of Selections from classic Italian Authors, weekly, on the *Canzoniere* of Dante, weekly, and in Italian Historical Grammar, twice weekly.

Associate Professor Morize conducted the following weekly courses in French literature: Les méthodes et les procédés de l'Histoire littéraire; Explication d'auteurs français; Le Mouvement des idées au début du XVIII^e siècle; Exercices pratiques et correction de dissertations françaises.

Mr. Leguy conducted a weekly course: Introduction à l'étude de la littérature française.

The staff and graduate students of the department assembled weekly in the Romance Journal Club for reviews of recent scientific literature and the presentation of papers of departmental interest.

The Seminary in the French Language met two hours fortnightly, under the direction of Professor Armstrong, the unpublished Old French version of *Barlaam et Josaphat* forming the subject of investigation. Copies or photographic reproductions of the existing manuscripts were compared with each other, their relation was determined, and a manuscript scheme was established. Then followed an examination of the dialectical peculiarities of the manuscripts and of the rhyme words which furnished, toward localizing and dating the unknown author, material that will be utilized in the further study in the Seminary of the same subject.

The Seminary in French Literature met two hours fortnightly, under the direction of Associate Professor Morize, Molière's *Tartuffe* forming the subject of study. As a preliminary, there was prepared a complete critical bibliography, covering the past twenty years, of works on *Tartuffe* and of general works on Molière. Thereafter special studies were devoted to the following points: composition and representation;—the *Tartuffe* Dispute;—literary sources;—social and contemporary satire in the play;—Molière and the Compagnie du Saint-Sacrement;—*Tartuffe* and the seventeenth century "querelle du théâtre";—*Tartuffe* and *Don Juan*;—dramatic composition of *Tartuffe*;—importance of the second act and criticism of the dénouement;—successive versions (1664, 1667, 1669);—versification;—intentions of Molière in the *Tartuffe*. The subject will be resumed next year, the ultimate purpose being the publication of a critical edition of the play.

In addition to the scheduled courses, the following lectures were given before the department:

Professor H. A. Rennert, of the University of Pennsylvania: "Lope de Vega in his own Plays and Ballads"; Professor F. M. Warren, of Yale University: "The Influence of Latin Style on Mediæval French Poetry"; Professor F. Baldensperger, of the University of Paris: "Alfred de Vigny et l'Angleterre"; Professor Abel Lefranc, of the University of Paris: "Rabelais."

2. Collegiate Courses.

French Elements, two sections, each four hours weekly: Section A, by Dr. Gruenbaum; Section B, for Engineering students, by Professor Brush; French 1, three sections, each four hours weekly, by Professor Brush, Dr. Gruenbaum, and Mr. Leguy; French 2, three hours weekly by Professor Brush; French 3-4, three hours weekly, by Mr. Leguy; French 5, weekly, by Mr. Leguy.

Spanish 1 and Spanish 3, each three hours weekly, by Professor Marden.

Italian 1 and Italian 2, each three hours weekly, by Associate Professor Shaw.

3. College Courses for Teachers.

French 1, the Elements of French, three hours weekly, by Professor Shedioe. French 2, Intermediate French, and French 3, Advanced French, each two hours weekly, by Professor Brush.

Dr. D. S. Blondheim, Henry E. Johnston Scholar for 1913-14, spent the year in work upon the French glosses in Raschi's commentary on the Talmud (1040-1105). He verified and corrected the manuscript of Arsène Darmesteter's French translation of the Hebrew context, added the readings of the Bomberg and the Romm editions of the Talmud, as well as the Hebrew and Aramaic forms of the words interpreted in French by Raschi, and made progress in the study of the French glosses. This work, now well advanced, will form a substantial addition to our knowledge of the earliest recorded appearance, meaning, and etymology of a number of French words.

EDWARD C. ARMSTRONG,
Professor of the French Language,
Chairman.

HISTORY

The thirty-first volume of the Studies in Historical and Political Science was completed in October by the publication of Dr. Magoffin's monograph on The Quinquennales. The thirty-second volume has also been completed during the present session, and consists of the following studies: Jurisdiction in the American Building-Trades Unions, by N. R. Whitney; Slavery in Missouri, 1804-1865, by H. A. Trexler; Colonial Trade in Maryland, 1689-1715, by Miss M. S. Morris.

The Albert Shaw Lectures on Diplomatic History were given by

Professor Frank A. Updyke of Dartmouth College, his subject being The Diplomacy of the War of 1812.

SEMINARY IN AMERICAN HISTORY.

The seminary in American history was conducted by Professor Latané. During the first half session the general subject was the American Revolution. Among the reports made were the following: "A Comparison of the Molasses Act of 1733 and the Sugar Act of 1764," by W. C. Spielman; "Writs of Assistance," by F. Bowers; "Lord Dunmore's War," by Miss L. G. Branham; "The Origin of the First Ten Amendments," by Miss L. K. Eubank; "The Parson's Cause," by E. L. Fox; "The Stamp Act," by Paul Fox; "The Coercive Acts of 1774," by K. R. Greenfield; "The Townshend Acts of 1767," by L. K. Koontz; "The Virginia Committee System and its Part in the American Revolution," by J. M. Leake; "The First Continental Congress," by H. F. Sturdy.

During the second half session the work of the seminary was devoted to the diplomatic history of the Civil War, and the following reports were made: "The Trent Affair," by B. O. Rouse; "Seward's Instructions to American Representatives abroad on Slavery as an Issue in the Civil War," by J. M. Leake; "The Effect of the War on the Production, Sale, and Manufacture of Cotton," by W. C. Spielman; "France and the Confederate Navy," by L. K. Koontz; "Foreign Consuls in the Confederate States," by E. L. Fox; "The Attitude of the British Government toward the Confederacy," by K. R. Greenfield; "The Confederate Cruisers," by Paul Fox; "Sumner's Attitude toward the Settlement of the Alabama Claims," by Miss L. G. Branham; "The Geneva Arbitration," by F. Bowers.

The following lecture courses were given by Professor Latané:

1. *The American Revolution and the Adoption of the Constitution.* Two hours weekly, first half-year. A critical study of the British colonial system as it existed prior to the last French and Indian War, the new policies adopted by the British government at the close of that war, the resulting opposition in the colonies, the early stages of the Revolution, the development of new governmental agencies, the Articles of Confederation, and the framing and ratification of the Constitution of the United States.

2. *American Diplomatic History from 1850 to the Present Time.* Two hours weekly, second half-year. A detailed study of the foreign relations of the United States during the Civil War period, the international questions raised by the struggle, the efforts of the Confederacy to secure foreign recognition, the attitude of the foreign powers, and a review of the more important diplomatic questions that have arisen since the Civil War.

3. *American History, for undergraduates (History 4).* Three hours weekly, through the year. A general course covering the whole field of American history, based on lectures, text-books, and assigned readings.

SEMINARY IN EUROPEAN HISTORY.

The Seminary of European History, conducted by Professor Vincent, devoted the first half-year to studies of the political and social

institutions revealed in the early Germanic codes of law. The questions of civil and criminal procedure; the political and civil status of the individual and the family; the conditions of agriculture; the implements employed; the housing of the people and their primitive industries were successively considered by members of the group. By analysis and comparison the various uses of legal material as historical evidence were brought forward in practical application. In the second half-year the early history of municipalities was the subject of co-operative inquiry. Beginnings were made in the mediæval conditions of Winchester, Gloucester, Coventry, Bristol, London, and York. One report on paternalism in the government of German cities laid the basis for more extended investigation in that field.

Professor Vincent also conducted a lecture course for graduates two hours a week during the year in mediæval European history. Beginning with early Germanic institutions, the development of government and social institutions was traced through the period of typical feudalism into the fourteenth century. The conditions found in England as well as in continental Europe were included in the discussion.

An undergraduate class meeting three hours a week, throughout the year (History 3), pursued the history of England from earliest times to the present. Text-books and collateral reading of narratives and documents led to discussion of the development of the English constitution in all of its important phases.

Dr. Ralph V. D. Magoffin conducted the following courses:

1. *History of Greece from the Dorian Invasion through the Persian Wars.* One hour weekly, through the year. Consideration was given to the various new theories about the Dorians and their early habitat in Greece. In connection with the Persian Wars emphasis was laid upon the early history of Asia Minor.

2. *History of Rome and Italy, from the Time of the Flavian Emperors to the Accession of Diocletian.* One hour weekly, through the year. Particular attention was paid to the extension of Roman citizenship throughout the Empire, to the development of Roman Law, and to the social and commercial conditions of the growing extra-Italian municipalities.

3. *History of Greece and Rome,* an undergraduate course in ancient history, known as History 1. Three hours weekly, through the year. The constitutional, political, social, economic, and artistic developments of Greece and Rome were traced by means of translated texts of the ancient historians with the aid of modern authorities. Reports on special topics, with map drawing on the part of the students and occasional illustrated lectures on the part of the instructor, served to expand and emphasize the important phases of this history.

JOHN H. LATANÉ,
Professor of American History.

POLITICAL ECONOMY

The work in Political Economy was directed by Professor Hollander, who met students daily, in seminary organization, for formal instruction and for co-operative research. The activity of the Economic Seminary in the investigation of the history, structure, and activity of labor organizations in the United States was supplemented by courses of lectures on certain phases of the history and theory of economic science, and on the nature and influence of particular economic institutions. Dr. George E. Barnett, Professor of Statistics, and Dr. N. R. Whitney, Instructor in Political Economy, assisted in the conduct of the work.

Economic Seminary. The students following political economy as a principal subject for the doctor of philosophy degree met weekly in Seminary organization under the direction of Professors Hollander and Barnett. During the current academic year, the economic Seminary has continued its investigations into the history, activities, and influence of labor organizations in the United States. Its membership has been limited to the advanced students preparing for a scientific career in economic study, and its primary design has been the development of sound method in economic research. The material resources necessary for the inquiry have been supplied by the continued generosity of the donor whose original gift made its inception possible. The papers and reports presented to the Seminary were as follows: "The Security Holdings of National Banks," by Professor Hollander; "The Helper and His Work," by J. H. Ashworth; "The Boycott on Materials," by Leo Wolman; "The Wages of Women in Baltimore," by Miss Mildred Rankin; "The History of the National Debt of Japan," by S. Kitasawa; "The Introduction of the Planer," by Professor Barnett; "The History of Licensing Systems in the United States," by C. C. Caldwell; Sakolski's "American Railroad Economics," by Leo Wolman; "The Activities and Policies of the Bureau of Labor Statistics," by Professor Royal Meeker, Commissioner of Labor Statistics; "The Organization of Unskilled Laborers," by W. O. Weyforth; "Unemployment among the Longshoreman," by D. P. Smelser; "The Character and Purpose of Union Policies toward the Helper," by J. H. Ashworth; "The Boycott on Commodities," by Leo Wolman; "The National Credit of Japan," by S. Kitasawa; "Wage Principles as determined by Arbitration Decisions," by J. N. Stockett; "The Early History of the Amalgamated Association of Iron, Steel and Tin Workers," by J. S. Robinson; "A Description of the Licensing System in America," by C. C. Caldwell; "The Organization of the Helper," by J. H. Ashworth; "The Mechanism of the Boycott," by Leo Wolman; "The Administration of the National Debt of Japan," by S. Kitasawa; "Unemployment among the Bricklayers," by D. P. Smelser; "The Enforcement of Union Regulations pertaining to the Helper," by J. H. Ashworth; "The History of the Boycott," by Leo Wolman; "The Working of the Licensing System," by C. C. Caldwell; "The Effects of the National Debt of Japan," by S. Kitasawa; "The Effect of the Unit of Government on Organization," by W. O. Weyforth; "The Social Surplus," by Professor Hollander; "The Social Aspects of the Helper System," by J. H. Ashworth; "The Distribution of Incomes," by Professor Hollander; "The Legality of the Boycott," by

Leo Wolman; "The Rate of Wages," by Professor Hollander; "Unemployment among the Carpenters," by D. P. Smelser; "The Underpaid, the Unemployed, and the Unemployable," by Professor Hollander.

Appreciable progress has also been made by members of the Seminary in the study of special aspects of the several questions assigned for investigation. During the summer, field work was carried on in various carefully selected localities and the data thus collected have since been supplemented and corrected by documentary study and personal interview.

Professor Hollander published in the December, 1913, number of the *American Economic Review* a paper on "The Security Holdings of National Banks," and in the May, 1914, number of the *Journal of Political Economy* a paper on "The Probable Effect of the New Currency Act on Bank Investments." During the past year there appeared in the *Johns Hopkins University Studies in Historical and Political Science*, Dr. N. R. Whitney's essay on "Jurisdiction in American Building Trades Unions" (Series xxxii, No. 1). Jacob Vanderlint's "Money Answers All Things" appeared in the reprint of economic tracts, edited by Professor Hollander. In March, 1914, Professor Barnett undertook for the United States Commission on Industrial Relations, the direction of an investigation into trade unionism and collective bargaining in the United States.

Professor Hollander conducted the following courses of lectures:

1. *The Development of English Opinion in the Eighteenth Century*, two hours weekly, during the year. A critical study was made of the growth of economic opinion from John Locke to Adam Smith, with particular reference to the elements contributing to the "Wealth of Nations."

2. *History and Theory of Taxation*, two hours weekly, during the year. A historical review was attempted of the rise and growth of compulsory public revenue with particular regard to the taxation of property.

Professor Barnett lectured during the year on Labor Problems. A critical study was made of wage statistics and the statistics of unemployment.

Dr. A. P. Winston delivered a course of five lectures on "The Economic Life of China."

Professor Josef Schumpeter, of the University of Grätz, gave a course of five lectures on "Capital and Labor."

Professor Karl Rathgen, of Hamburg, gave two lectures on "Some Present Economic Problems of Germany."

Professor Don C. Barrett, of Haverford College, gave a course of five lectures on "The Greenbacks and Resumption of Specie Payments."

Mr. Logan G. McPherson, Director of the Bureau of Railway Economics, gave five lectures on "Railway Transportation."

Dr. Franz Oppenheimer, of the University of Berlin, delivered two lectures on "The Theory of Wages."

In coöperation with the departments of history and political science, opportunity was afforded in the Historical and Political Science Association for the presentation and discussion of original papers in economic science by instructors, advanced students, and invited speakers, and for the review of current publications of importance in these several fields.

A reading class was organized and successfully conducted by the more advanced students of the department for the coöperative study of economic texts and for the critical discussion of current literature.

The Seminary collection of English economic texts has been strengthened by purchases from the Hutzler fund and by additional generous gifts from a friend of the Department.

Further progress was made during the past year in the collection of trade-union documents. The Seminary is now in receipt of all important trade-union journals, proceedings of conventions, constitutions, and similar publications. Through purchase and gift the collection has been augmented by the addition of similar printed material of earlier years, and notably by the addition of complete files of the publications of certain old unions, hitherto unrepresented. These additions have made accessible to students of trade-unionism in the United States a larger amount of documentary material than is to be found in any other place.

Professor Hollander, Professor Barnett and Dr. Whitney conducted the following undergraduate courses:

Political Economy I, three hours weekly, through the year. In the first half-year the industrial development of England and the United States was studied. In the second half-year systematic instruction was given in the elementary principles of economic science.

Political Economy II, three hours weekly, through the year. In the first half-year the theory and practice of finance were considered. In the second half-year the principles of monetary science were taught.

Political Economy III, three hours weekly, through the year. In the first half-year the theory and methods of statistics were studied. In the second half-year instruction was given in advanced economic theory.

JACOB H. HOLLANDER,
Professor of Political Economy.

POLITICAL SCIENCE

The work in political science has been directed by Professor Willoughby, and has had for its primary purpose the preparation of advanced students for professional and original work in the fields of constitutional law, international law and diplomacy, and political theory. The instruction has also aimed to supply a training for students desiring to enter the higher branches of the public service, as well as to furnish a philosophical equipment to those who expect later to pursue the study and practice of the law.

Professor Willoughby has continued to act as the Managing Editor of *The American Political Science Review*, now in its eighth volume.

Seminary and Journal Club. A weekly Seminary and Journal Club was held, devoted to the consideration of dissertation reports, the discussion of current questions in constitutional and international law, and the review of scientific journals and new treatises in the field of political science. Among the reports presented were the following: "State Administration in Maryland," by J. L. Donaldson; "Constitutional Doctrines of Justice Harlan as Found in his Dissenting Opinions," by F. B. Clark; "Legal Aspects of the Sulzer Impeachment," by T. Yokoyama; "The Seventeenth Amendment," by Lindsay Rogers; "The Development of Japanese Law," by T. Yokoyama; "The Caucus in its Relation to Party Government," by W. W. Willoughby; "American Doctrines of Church and State," by O. L. Owens; "Japanese Characteristics," by F. W. Heckleman; "Suffrage Clauses in the Constitutions of the Southern States," by F. B. Clark; "Persian Jurisprudence," by Y. B. Mirza; "The Interpretation of the Sherman Anti-Trust Law of 1890," by L. H. Buckler; "Freedom of Speech and Press as Constitutionally Secured in the United States," by Lindsay Rogers.

Lecture Courses. The following lecture courses were given:

1. United States Constitutional Law. *Two hours weekly, through the year.* By Professor Willoughby.
2. Theories of Law. *One hour weekly, first half-year.* By Professor Willoughby.
3. Law in its Ethical Aspects. *One hour weekly, second half-year.* By Professor Willoughby.
4. Fundamental Rights and Duties of States as Members of the Family of Nations. *One hour weekly, through the year.* By Dr. J. B. Scott.
5. Principles of International Law: Neutral Rights and Obligations. *One hour weekly, through the year.* By Dr. J. B. Scott.
6. Historical Foundations of Present European International Politics. *Ten lectures.* By Dr. C. G. Fenwick.
7. Theory of the State. *Ten lectures.* By Mr. Ernest Bruncken.

W. W. WILLOUGHBY,
Professor of Political Science.

PHILOSOPHY AND EDUCATION

PHILOSOPHY

In addition to the performance during the year of his special duties as Executive Secretary of the Administrative Committee of the University and as Dean of the Collegiate Faculty, Professor Griffin lectured throughout the year on the History of Continental Philosophy from Descartes to Kant.

During the spring of 1914 one of the numbers of the *University Circular* was devoted to the publication of three philosophical papers by members of the staff: "Some Present-Day Tendencies in Philosophy," by Professor Griffin; "Images and Ideas," by Associate Professor Dunlap; and "On the Existence of Ideas," by Professor Lovejoy. The papers dealt in the main with a single group of related questions which have of late especially engaged the attention of members of the department, and had formed the topic of the course on "The Conception of Consciousness," given jointly by Professors Lovejoy and Dunlap during the year.

During the year 1914-1915 Professor Lovejoy will give a further course in the study of the history of ideas in the eighteenth and early nineteenth centuries, in continuation of those given during the two previous years. These courses, which are designed to be of service to students of the history of literature as well as students of philosophy, attempt to deal with the intellectual history of these periods in a manner somewhat different from that usually employed. The units of the study are the characteristic ideas, preconceptions, ruling categories, or even favorite phrases of the period. The sources and the logical significance of each of these are considered, and the diverse manifestations and applications of it in technical philosophical systems, in the literatures of the principal European countries, in religious movements and in some cases in the tendencies of scientific inquiry and opinion, are investigated. Such a mode of analysis of the intellectual history of Europe discloses, it is believed, much more effectually than the ordinary study of systems as units, or of the writings of individual authors, a certain important class of the determining factors in the movements of Occidental thought; and it permits a useful coöperation between the philosophical, the literary and the historical departments, in a way which ought to render the work of each more effective. The course in the department of philosophy during 1914-1915 which is designed to be a contribution to this type of study will deal with certain characteristic ideas of the philosophy of romanticism.

EDUCATION

The Educational Seminary has been conducted by Professor Buchner. The work of the year was restricted to a study of the problems in the newly developed field of educational measurement. The topics of the special papers and researches presented by the members included the unit of educational measurement, the development of methods in educational measurement, the correlation of mental abilities in high school students, the learning process, the measurement of individual differences, the Stone and Courtis tests in arith-

metic, the scales for the measurement of composition, drawing, and penmanship, the measures of spelling and the comparative values of deduction and induction as methods of teaching, and questions and marks as measures of education.

The course of lectures on Educational Psychology was devoted to a study of the mental characteristics and the educational problems of adolescence.

In addition to being present at eleven Teachers' Institutes in Maryland, Professor Buchner continued to visit the county high schools in the state to obtain information which would be of assistance in the adjustment of the relations between the schools and the University which is called for in the law creating the Technical School.

He also made a special study of the results of the teaching in the Maryland high schools, in so far as these could be obtained from the records made by the high school graduates who sought admission as collegiate and engineering students in the University. The results of this inquiry were presented at the annual meeting of the Maryland State Teachers' Association, in Ocean City, on June 30, under the title, "Further Studies of Our High Schools." He delivered two series of lectures, of five each, at the Allegany County Teachers' Institute, and also addressed the Maryland High School Teachers' Association on "The Improvement of High School Study and Instruction," and the Potomac Valley Teachers' Round Table, at Charlestown, W. Va., on "The Three Functions of a School." By the arrangement of a university alumnus, he presented to the students of the Western High School, of Washington, D. C., an illustrated account of the new Technical School at the University.

The dates and topics of the meetings of the Graduate Conference were as follows:

December 15.—"The Individual and the State," by Professor W. W. Willoughby.

March 16.—"Recent Cases of Supposed Reasoning in Animals: the Elberfeld Horses and the Mannheim Dog," by Professor John B. Watson.

UNDERGRADUATE COURSES

1. Undergraduate courses in Logic and Ethics were conducted by Professor Griffin, and a course in Psychology by Associate Professor Dunlap.

All candidates for the degree of Bachelor of Arts are required to follow these courses during the last year of residence. The several subjects are distributed through the year as follows: Deductive and Inductive Logic, October 7 till the Christmas recess; Psychology, January 5 to April 8; Ethics, April 16 to June 1. Text-books are used in each subject, as affording definite means of acquisition, but informal lectures, passages assigned for reading, discussions in the class, the preparation of essays, etc., are largely relied upon in the presentation.

2. In the College Courses for Teachers, a course on the History of Education and one on the Principles of Education, each two hours a week through the year, were given by Professor Buchner.

In the same group of courses, Associate Professor Dunlap conducted two courses in Psychology, each meeting two hours a week, one in Human Psychology, with one lecture and one laboratory period a week, and the other an experimental course consisting of two laboratory periods a week.

PUBLICATIONS

E. H. GRIFFIN:

Some Present-Day Problems of Philosophy. *The Johns Hopkins University Circular*, No. 263, 1914, 4-24.

E. F. BUCHNER:

A Cyclopaedia of Education, 1913, V: "John Paul F. Richter," 188; Johann Karl Friedrich Rosenkranz," 205-206; "Antonio Rosmini-Serbati," 206-207; "Arthur Schopenhauer," 289-291; "Johann Christoph Kaspar Spurzheim," (with K. Dunlap), 405-406.

The 1913 Summer Courses of the Johns Hopkins University. *Forty-Seventh Annual Report of the Department of Public Education of the State of Maryland*, Baltimore, 1913, 155-162.

The Nineteen-Thirteen Summer Courses. *The Johns Hopkins Alumni Magazine*, 1913, II, 47-50.

The Local Extension of Graduate Study. *The Johns Hopkins Alumni Magazine*, 1914, II, 103-107.

A. O. LOVEJOY:

Review of Hobhouse's "Development and Purpose." *The Nation*, vol. 97, Aug. 21, 1913, pp. 163-4.

Notice of Külpe's "Philosophy of the Present in Germany." *The Nation*, vol. 97, Sept. 4, 1913, p. 215.

Some Antecedents of the Philosophy of Bergson. *Mind*, N. S., Oct., 1913, pp. 465-483.

Realism versus Epistemological Monism. *Jour. of Philos.*, x, Oct. 9, 1913, pp. 561-572.

Bergson and Romantic Evolutionism. Univ. of Calif. Press, 1914, 61 pp.; also in *Univ. of Calif. Chronicle*, Oct., 1913.

Review of Fuller's "The Problem of Evil in Plotinus." *The Nation*, vol. 97, Nov. 6, 1913, pp. 438-9.

Review of Leuba's "A Psychological Study of Religion." *Int. Jour. of Ethics*, Jan., 1914.

Report of the Joint Committee of Inquiry of the American Philosophical and Psychological Associations, (with J. E. Creighton and others) *Jour. of Philos.*, Jan., 1914, pp. 67-81.

The Profession of the Professorate. *The Johns Hopkins Alumni Magazine*, II, 1914, pp. 181-185.

On the Existence of Ideas. *The Johns Hopkins University Circular*, No. 263, 1914, pp. 42-99.

Reality, Relativity and Contradiction. *Jour. of Philos.*, XI, 1914, pp. 421-430.

Review of Croce's "Giambattista Vico." *The Nation*, 1914.

German Scholars and 'Truth About Germany.' *The Nation*, Sept. 24, 1914, p. 376.

Review of Holt's "The Concept of Consciousness." *Philos. Review*, 1914, pp. 664-677.

EDWARD F. BUCHNER,
Secretary.

PSYCHOLOGY

During the year 1913-1914 advanced courses in Physiological Psychology and in the Behavior of Vertebrates were conducted by Professor Watson. Associate Professor Dunlap gave courses in Introductory Experimental Psychology and research courses in Experimental Psychology, and met the fourth-year class of undergraduates, for three months, for an elementary course in psychology.

PSYCHOLOGICAL PUBLICATIONS

By Knight Dunlap:

"The Self and the Ego." *Psychological Review*, 1914, **XXI**, pp. 62-69.

"The Pragmatic Advantages of Freudo-Analysis. *Psychoanalytic Review*, 1914, **I**, pp. 149-152.

"Images and Ideas." *The Johns Hopkins University Circular*, 1914, No. 3, pp. 26-41.

By John B. Watson:

"Behavior: An Introduction to Comparative Psychology. Henry Holt & Company, 1914, pp. xii + 439.

"Literature for 1912 on the Behavior of Vertebrates." *Journal of Animal Behavior*, 1913, pp. 446-462. (With K. S. Lashley.)

"A Circular Maze with Camera Lucida Attachment." *Journal of Animal Behavior*, 1914, pp. 56-59.

By Helen B. Hubbert:

"Time *versus* Distance in Learning." *Journal of Animal Behavior*, 1914, pp. 60-72.

By G. C. Basset:

"Habit Formation in a Strain of White Rats with Less than Normal Brain Weight." *Behavior Monograph Series*, No. 9, 1914.

By G. R. M. Wells:

"The Influence of Stimulus Duration on Reaction Time." *Psychological Monographs*, Vol. 15, 1914, pp. 68.

JOHN B. WATSON,
Professor of Comparative and Experimental Psychology,
and Director of the Psychological Laboratory.

TABULAR STATEMENT OF COURSES OF INSTRUCTION, 1913-14

INSTRUCTORS	COURSES	No of hours per week	No. of students 1st half-year	No. of students 2d half-year
MATHEMATICS				
Morley	Seminary.	1	11	11
Morley	Higher Geometry.	3	10	
Morley	Theory of Functions.	3		9
Coble	Discontinuous Groups.	2	7	7
Coben	Theory of Functions.	2	7	7
Coben	Differential Geometry.	2	5	4
Undergraduate Courses				
Coble	Projective Geometry.	3	4	5
Hulburt	Plane Algebraic Curves.	3		12
Coben	Differential Equations; Calculus; Mechanics.	3	11	37
Hulburt	Differential and Integral Calculus. (Two sec-	10	41	
Bateman	tions.)			
Hulburt	Solid Geometry; Analytic Geometry; Calculus.	21	79	71
Coben	(Three sections.)			
Shenton	Solid Geometry; Analytic Geometry.	3	26	
Coble				
PHYSICS				
Ames	Journal Meeting.	1	9	9
Ames	Physical Seminary.	1	9	9
Ames	Theoretical Mechanics.	4	7	7
Ames	General Physics.	3	187	127
Bliss	Electricity and Magnetism.	3	2	
Bliss	Thermodynamics; Mechanics.	3	24	22
Pfund	Physical Optics.	3		4
Anderson	Celestial Mechanics.	2	7	6
Anderson	General Astronomy.	3	9	8
Ames	Laboratory Work.		170	156
Bliss				
Anderson				
Pfund				
Plimpton				
ELECTRICAL ENGINEERING				
Whitehead	Electrical Engineering (Course 2).	2	5	4
Whitehead	Electrical Engineering (Course 1).	2	7	7
Fullen	Laboratory Work.		10	9
Whitehead				
Fullen				
CIVIL ENGINEERING				
Tilden	Structural Mechanics.	3	5	4
Tilden	Engineering Drawing.	4	32	31
MECHANICAL ENGINEERING				
Thomas	Thermodynamics.	3	5	5
Thomas	Engineering Drawing.	4	32	31

INSTRUCTORS	COURSES	No of hours per week	No. of students 1st half-year	No. of students 2d half-year
CHEMISTRY				
Morse Jones, H. C. Lovell	Journal Meeting.	1	40	38
	Osmotic Pressure Researches.	2		36
	Physical Chemistry.	3	39	37
Acree Gilpin Lovell	Advanced Inorganic Chemistry; Electro-Chemistry.	2	33	
	Advanced Organic Chemistry.	2	31	30
Gilpin Lovell	Laboratory Course (Undergraduate Course 4).	6	7	8
	Organic Chemistry (Undergraduate Course 3).	3	27	27
Gilpin Morse	Inorganic Chemistry (Undergraduate Course 2).	3	13	14
	General Chemistry (Undergraduate Course 1).	3	28	32
Jones, H. C. Gilpin Acree Lovell Fraser Holland Bouiller	Laboratory Work.		108	121
GEOLOGY				
Clark Clark Reid Mathews Mathews Mathews Swartz Swartz Singewald Clark Reid Mathews Swartz Berry Singewald Gardner Abbe, C. Bauer, L. A. Wright, F. E.	Journal Club.	1	18	18
	Historical Geology.	2	9	9
	Dynamic Geology.	2	8	7
	Petrography.	3	7	7
	Field Work.		9	9
	Applied Geology.	3	10	11
	Mineralogy and Elementary Petrography.	3	14	14
	Elements of Geology.	3	34	34
	Ore Deposits of the United States.	2	7	8
	Laboratory Work.		56	57
ZOOLOGY, BOTANY, PLANT PHYSIOLOGY				
Andrews Jennings Johnson Livingston Grave Mast Jennings Lovejoy Jennings Mast Johnson. Johnson. Livingston Livingston Andrews Grave Grave	Journal Club.	2	16	17
	Zoological Seminary.	1	9	9
Jennings Lovejoy Jennings Mast Johnson. Johnson. Livingston Livingston Andrews Grave Grave	Genetics.	3	7	6
	General Physiology.	2	4	4
	Botanical Seminary.	1	5	6
	Reproduction and Phylogeny.	3	4	3
	Problems in Plant Physiology.		2	2
	Plant Physiology.		4	4
	General Biology.	3	26	25
	Embryology.	3		13
	Comparative Anatomy of Vertebrates.	3	12	12

Tabular Statement of Courses of Instruction 65

Instructors	Courses	No of hours per week	No. of students 1st half-year	No. of students 2d half-year
Grave	Natural History (General Zoology).	8		28
Andrews	Embryology.	8		26
Andrews	Laboratory Work.		58	88
Jennings				
Johnson				
Livingston				
Grave				
Mast	Colloid Chemistry. (5 lectures.)			
Ostwald, W.				
	GREEK			
Gildersleeve	Seminary: Plato.	2	9	8
Gildersleeve	Greek Syntax.	1		6
Gildersleeve	Practical Exercises.	2	7	
Miller	Aristotle's Nicomachean Ethics and Politics.	1	4	4
Miller	Greek Philosophy.	1	9	8
Miller	Advanced Prose Composition.	1		4
Robinson	Plato's Republic.	1	8	7
Robinson	History of Greek Literature.	1	28	28
Bolling	The Homeric Question. (Twelve lectures.)	1		7
Spieker	St. Luke's Gospel.	2	9	
Spieker	Lysias; Prose Composition.	8	2	
Robinson	Isocrates; Euripides; Composition.	3		2
Miller				
Miller	Aristophanes.	2		7
Spieker	Elementary Greek.	8	7	5
Miller	Xenophon; Plato; Herodotus; Composition.	4	5	5
Miller				
	LATIN			
Smith	Seminary: Livy; Tacitus.	2	9	7
Smith	Historical Latin Syntax.	1	9	7
Smith	Apollonius of Rhodes and the Roman Epic.	1	12	10
Smith	Roman Historians.	1	9	7
Smith	Tibullus.	2	5	5
Smith	History of Roman Literature.	1	25	25
Mustard	Didactic Poetry.	1	10	8
Mustard	Tacitus; Horace.	8	9	8
Mustard	Livy; Vergil; Composition.	4	25	26
	CLASSICAL ARCHÆOLOGY AND ART			
Robinson	Seminary: Greek and Roman Sculpture.	1	6	6
Robinson	Greek Vases and Mythology.	1	10	12
Robinson	Greek Inscriptions.	1	11	10
Waggon	Roman Epigraphy.	1	7	5
Waggon	Roman Life.	1	20	20
	SANSKRIT AND COMPARATIVE PHILOLOGY			
Bloomfield	Seminary: Rig-Veda.	1	8	2
Bloomfield	Pali and Buddhist Literature.	1	8	2
Bloomfield	Comparative Philology.	1	20	20
Bloomfield	Comparative Grammar (Indo-European Vowels).	1	7	6
Bloomfield	Introduction to the Avesta.	1	2	2

INSTRUCTORS	COURSES	No. of hours per week	No. of students 1st half-year	No. of students 2d half-year
SEMITIC LANGUAGES				
Haupt	Seminary: Ancient Hebrew Poetry; Minor Prophets.	2	6	6
Haupt	Maccabean Psalms.	1	6	
Haupt	Prose Composition (Hebrew, Arabic, Assyrian).	1	6	5
Haupt	Assyrian Grammar; Cuneiform Texts.	1	4	4
Haupt	Journal Meeting.	1		
Haupt	} Comparative Hebrew Grammar.	1	5	6
Blake				
Rosenau	Hebrew Bible: Cursory Readings.	1	2	2
Rosenau	Post-Biblical Hebrew (Mishnah; Talmud).	2	1	1
Rosenau	Hebrew (third year).	3	2	3
Rosenau	Unpointed Hebrew Texts.	1	2	2
Blake	Hebrew Phonology.	1	5	5
Blake	Hebrew Grammar.	1		5
Ember	Hebrew Conversation.	1	4	4
Ember	Hebrew (second year).	2	2	2
Ember	} Elementary Hebrew. (Two sections.)	6	7	7
Schick				
Blake	Syriac.	1	1	1
Blake	Ethiopic: Elementary.	1	1	1
Blake	Biblical Aramaic Grammar; The Book of Daniel.	1	1	2
Ember	Arabian Nights.	1	1	
Ember	Arabic Prose Writers.	2	1	1
Ember	Koran.	1		1
Schick	Elementary Arabic.	2	4	4
Schick	Old Babylonian Texts.	1	2	2
Ember	Pyramid Texts.	1	1	1
Ember	Hieratic Texts.	1	1	1
Ember	Coptic: Advanced.	1	1	1
Ember	Egyptian for beginners.	1	1	1
Blake	History of the Ancient East.	1	3	3
Schick	Assyrian: Elementary.	2	2	2
Schick	Assyrian Inscriptions.	1	2	2
Schick	Biblical Archaeology.	1	1	1
Schick	Literature of the Old Testament.	1	1	1
Seiple	Japanese.	1	2	2
ENGLISH				
Bright	English Seminary: Literature of XVIII Cent.	4	12	14
Bright	Historical Grammar.	1	4	4
Bright	Literature of Earliest Period.	1	6	6
Bright	Journal Meeting. (Alternate weeks.)	2	12	14
Bright	Anglo-Saxon.	2	4	4
Undergraduate Courses				
Greene	English Literature 3. (Shakespeare.)	2	8	8
Greene	English Literature 3. (1765-1892.)	3	14	13
Greene	English Literature 2. (1600-1774.)	3	14	16
Greene	English Literature 1. (700-1600.)	3	24	23
Myers	English Literature 5. (General Survey.)	3	20	17
French	English Composition 4.	3	8	8
French	English Composition 1.	3	26	32
Myers	English Composition 2.	1	16	10
Myers	English Composition 1. (Two sections.)	6	72	70
French	Public Speaking 2.	1	31	31
French	Public Speaking 1. (Six sections.)	6	50	49

Tabular Statement of Courses of Instruction 67

Instructors	Courses	No. of hours per week	No. of students 1st half-year	No. of students 2d half-year
GERMAN				
Wood	German Seminary: "Sturm und Drang"; Parzival.	3	5	5
Wood	Das Junge Deutschland.	2	5	5
Wood Collitz Collitz	Germanic Society. (Alternate weeks.)	2	9	9
Collitz	Germanic Seminary: Old Frisian Texts; Old High German Dialects.	2	3	3
Collitz	German Dialects.	1	3	3
Collitz	Old Norse.	1	3	3
Collitz	Old High German.	1	1	
Kurrelmeyer	Wieland.	1		3
Kurrelmeyer	Middle High German.	2	1	
<i>Undergraduate Courses</i>				
Kurrelmeyer	Contemporary Literature.	3	6	6
Roulston	Lessing; Goethe; Schiller; Prose Composition.	3	9	9
Wood Roulston Roulston Starck	Goethe's <i>Faust</i> ; History of German Literature.	3	5	5
Kurrelmeyer	Modern Prose Readings. (Three sections.)	12	60	50
Kurrelmeyer	Elementary German.	4	12	12
Kurrelmeyer	Scientific Readings.	2	9	9
Kurrelmeyer	Historical Readings.	2	5	4
Hofmann	Oral Exercises. (Two sections.)	3	3	6
ROMANCE LANGUAGES				
Armstrong	French Seminary (Language.) Alt. weeks.)	2	3	4
Armstrong	Phonetics and French Pronunciation.	1	5	4
Armstrong	French Syntax.	1	3	4
Armstrong	French Phonology and Morphology.	3	2	2
Armstrong	Early Old French Texts.	1	2	2
Armstrong	Galloic Folk Latin.	2	3	
Morise	French Seminary (Literature). (Alt. weeks.)	2	3	3
Morise	Méthodes et procédés de l'Histoire littéraire.	1	7	7
Morise	Explications d'auteurs français (XVIIe au XIX Siècle).	1	7	7
Morise	Mouvements des Idées au début du XVIIIe Siècle.	1	12	12
Morise	Exercices pratiques, etc. (Alt. weeks.)	1	7	3
Leguy	Introduction à l'Etude de la Littérature française.	2	4	3
Brush	Romanticism and Idealism.	1	4	4
Marden	Old Spanish Readings.	1	4	4
Marden	Spanish Drama before Lope.	1	3	3
Shaw	<i>Canzoniere</i> of Dante.	1	6	5
Shaw	Selections from Classic Italian Authors.	1	3	3
	Romance Journal Club.		15	16
<i>Undergraduate Courses</i>				
Brush	French. (Course 2.)	3	9	8
Brush	French. (Course 1, Section A.)	4	20	16
Brush	French. (Elementary, Section B.)	4	31	28
Grünbaum	French. (Course 1, Section B.)	4	17	16
Grünbaum	French. (Elementary, Section A.)	4	21	19
Leguy	French. (Course 5.)	1	3	3
Leguy	French. (Course 3-4.)	3	6	6
Leguy	French. (Course 1, Section C.)	4	12	11
Marden	Spanish. (Course 3.)	3	6	6
Marden	Spanish. (Course 1.)	3	4	4

INSTRUCTORS	Courses	No. of hours per week	No. of students 1st half-year	No. of students 2d half-year
Shaw	Italian. (Course 2.)	8	2	2
Shaw	Italian. (Course 1.)	8	7	7
Baldensperger	French Enthusiasm about America, 1770-1789; Alfred de Vigny et l'Angleterre.			
Ducros, J.	La Poésie après les Romantiques. [Alliance française]			
Lefranc, A.	Rabelais.			
Bennert, H. A.	Lope de Vega in his own Plays and Ballads.			
Warren, F. M.	Influence of Latin Style upon Mediæval French Poetry.			
HISTORY				
Latané	Seminary: American History. (Alt. weeks.)	2	10	10
Latané	American Revolution.	2	19	
Latané	American Diplomatic History.	2		19
Latané	American History. (Undergraduate Course 4.)	8	26	26
Vincent	Seminary: European History. (Alt. weeks.)	2	8	8
Vincent	Early Germanic History.	2	13	14
Vincent	English History. (Undergraduate Course 3.)	8	83	83
Magoffin	History of Rome and Italy.	1	14	14
Magoffin	History of Greece.	1	14	13
Magoffin	Classical History. (Undergraduate Course 1.)	8	11	9
Updyke, F. A.	Diplomacy of the War of 1812. [Albert Shaw Lectureship.]			
POLITICAL SCIENCE				
Willoughby	Political Science Seminary. (Alt. weeks.)	2	10	9
Willoughby	Journal Meeting. (Alt. weeks.)	2	10	9
Willoughby	Theories of Law.	1		21
Willoughby	Principles of Jurisprudence.	1	20	
Willoughby	United States Constitutional Law.	2	22	21
Scott, J. B.	Fundamental Rights of States.	1	15	14
Scott, J. B.	Principles of International Law.	1	21	20
Bruncken, E.	Theory of the State. (10 lectures.)			
Fenwick, C. G.	Historical Foundations of Present European International Politics. (10 lectures.)			
POLITICAL ECONOMY				
Hollander	Economic Seminary.	2	8	8
Barnett	Development of Economic Theory.	2	10	10
Hollander	Theory and Practice of Taxation.	2	19	17
Hollander	Labor Problems.	1	17	18
Barnett	Statistical Methods. (Undergraduate Course 3.)	8	9	
Hollander	Economic Theory. (Undergraduate Course 3.)	8		10
Hollander	Finance. (Undergraduate Course 2.)	8	18	
Whitney	Money and Banking. (Undergraduate Course 2.)	8		18
Barnett	Economic History; Principles of Economics. (Undergraduate Course 1.)	8	32	29
Whitney	Greenbacks and Resumption of Specie Payments. (5 lectures.)			
Whitney	Present Problems in Railway Transportation. (5 lectures.)			
Barrett, D. C.	Theory of Wages. (2 lectures.)			
McPherson, I. G.	Some Present Economic Problems of Germany. (2 lectures.)			
Oppenheimer, F.	Capital and Labor. (5 lectures.)			
Rathgen, K.	Economic Life of China. (5 lectures.)			
Schumpeter, J.				
Winston, A. F.				

Tabular Statement of Courses of Instruction 69

Instructors	Courses	No. of hours per week	No. of students 1st half-year	No. of students 2d half-year
PHILOSOPHY AND EDUCATION				
Lovejoy	Philosophical Seminary.		2	1
Lovejoy	Transition to Romantic Period.	2	4	4
Lovejoy	Conception of Consciousness.	1	4	4
Dunlap	Continental Philosophy from Descartes to Kant.	1	4	5
Griffin	Vitalism.	1	9	9
Lovejoy	Educational Psychology.	1	6	7
Jennings	Educational Seminary.	2	4	5
Buchner	Outlines of the History of Philosophy.	2	4	4
Buchner	Logic (Undergraduate Philosophy 1.) [Until Dec. 20.]	3	44	
Griffin	Ethics. (Undergraduate Philosophy 1.) [After April 16.]	3		44
Dunlap	Psychology. (Undergraduate Philosophy 1.) [Jan. 5 to April 8.]	3		44
PSYCHOLOGY				
Watson	Seminary: Animal Behavior.		3	3
Watson	Animal Behavior. (Research.)		2	2
Watson	Physiological Psychology.	2	8	10
Dunlap	Experimental Psychology. (Research.)	6	1	1
Dunlap	Experimental Psychology. (Introductory Course.)	6	4	4
DRAWING				
Whiteman	Freehand and Mechanical Drawing.	9	64	55
COLLEGE COURSES FOR TEACHERS				
Olpin	Chemistry (including laboratory work, 3 hours).	5	6	6
Lovell	Principles of Education.	2	5	5
Buchner	History of Education.	2	18	18
Myers	English Composition 1.	2	24	20
French	English Composition 2.	2	17	16
Gay	English Literature.	2	32	28
Sheloe	French 1.	3	12	12
Brush	French 2.	2	10	7
Brush	French 3.	2	12	11
Proetlicher	German 1.	3	8	7
Roulston	German 2.	3	9	8
Wood	German 3.	2	5	6
Abel	History.	2	8	7
Mustard	Latin (Livy; Terence).	3	6	3
Dunlap	Psychology 1 (including laboratory work, 6 hours).	7	7	6
Dunlap	Psychology 2 (laboratory work).	6	1	

REPORT ON THE COLLEGE COURSES FOR TEACHERS

TO THE ADMINISTRATIVE COMMITTEE OF THE FACULTY:

I have the honor to submit the following report on the work of the College Courses for Teachers, conducted in coöperation with Goucher College, during the academic year, October 14, 1913, to May 30, 1914.

This was the fifth year of these courses, the plans for which are stated in detail in the *University Circular* of June, 1913. Of the courses announced, instruction of standard collegiate grade was given in the following: Chemistry, Principles of Education, English I, II, and III, French I, II, and III, German I, II, and III, History, Latin, and Psychology I and II. Owing to the small registration the courses announced in Italian, Mathematics, and Spanish were withdrawn. A course in the History of Education, not announced in the circular, was given to meet the needs of the Affordby Training School for Kindergartners, for which special arrangements were made in order to utilize these courses for instruction in this particular subject to the members of its senior class. These courses were conducted by fourteen instructors, four of whom were members of the staff of Goucher College, the remainder of the University.

The enrollment in the courses was one hundred and sixty-three the first half-year, and one hundred and forty-five the second half-year, the total enrollment for the year being one hundred and sixty-seven students. Six of these being double registrations from other departments, the net registration of the year was one hundred and sixty-one students. Twenty-one were men and one hundred and forty-six were women. Of the one hundred and nineteen students registered in the courses last year, forty-three continued their registration this year.

A conference of the Deans of the two institutions with the Instructors in these courses was held on May 8, 1914. The report made by the latter on the character and scope of the work done by their students indicated that it continued, as during the four years past, to maintain the standards required in the regular collegiate classes. The following amounts of credit for the courses were recommended and authorized: Chemistry, four and one-half hours, or less (depending upon individual work); Principles of Education, three hours; History of Education, three hours; English I, three hours (for a grade of eight or more), two hours (for a grade of six or less than eight); English II, three hours (for a grade of eight or more), two hours (for a grade of six or less than eight); English III, three hours; French I, four hours; French II, three hours; French III, three hours; German I, four hours; German II, three hours, or less (depending upon individual work); German III, three hours; History, three hours; Latin, four and one-half hours; Psychology I, two hours; Psychology II, two hours. It was voted

that all credits recommended be made a matter of permanent record in the office of the Registrar.

Under the plan of the management of the courses the University still has a deficit to carry. In view of the increased usefulness of the work undertaken by the students, the Committee has recommended that the courses be continued in the year 1914-15.

Since the beginning of these courses in 1909, Professor John B. Van Meter has been a member of the Committee, representing Goucher College. At the close of the year, owing to his retirement from active service at the college, he severed his connection with the Committee. From the beginning he has been active and sympathetic in the labor of maturing the plans for work from year to year. He has been succeeded on the Committee by Professor Eleanor L. Lord, Dean of the Faculty of Goucher College.

EDWARD F. BUCHNER,
Chairman.

REPORT OF THE DIRECTOR OF THE SUMMER COURSES

TO THE ADMINISTRATIVE COMMITTEE OF THE FACULTY:

I have the honor to present the following report of the fourth session of the Summer Courses of the University, which was held during the six weeks from July 6 to August 13, 1914.

The scope of the instruction which had been carried out in the previous sessions and found to be serviceable in meeting the chief needs of summer students, was used in perfecting the plans for 1914. The assistance of the State, City, and County Superintendents of Schools was freely given in completing the details of the courses to be provided. The Summer Courses have, through this practice of four years, virtually become the result of the coöperative work of the University and the public school officers in Maryland. Fifty-one courses were offered in sixteen subjects, as listed below. Archaeology and Spanish were the two subjects offered for the first time. By the readjustment of subject matter and by the addition of totally new material, as customary in former years, twenty-one practically new courses were made available, as follows: two in Education, one in English Composition, three in English Literature, two in French, two in German, three in History, two in Latin, one in Manual Training, three in Mathematics, one in Physics, and one in Politics.

The persons appointed to give instruction were as follows:

<i>Archæology and Greek Literature</i>	2 courses.
David M. Robinson, Professor.	
<i>Biology</i>	2 courses.
John P. Givler, Instructor in Summer Courses.	
Austin R. Middleton, Assistant.	
<i>Chemistry</i>	4 courses.
J. Elliott Gilpin, Collegiate Professor.	
James E. L. Holmes, Assistant.	
<i>Domestic Science</i>	3 courses.
Agnes E. Harris, Instructor in Summer Courses.	
<i>Education</i>	9 courses.
Edward F. Buchner, Professor.	
Frances M. Kelsey, Instructor in Summer Courses.	
Florence M. Lane, Instructor in Summer Courses.	
Willard S. Small, Instructor in Summer Courses.	
Leonora E. Taft, Instructor in Summer Courses.	
George R. M. Wells, Instructor in Summer Courses.	
<i>English Composition</i>	3 courses.
Robert M. Gay, Instructor in Summer Courses.	
John M. McBryde, Instructor in Summer Courses.	

<i>English Literature</i>	3 courses.
John M. McBryde, Instructor in Summer Courses.	
Robert M. Gay, Instructor in Summer Courses.	
<i>French</i>	3 courses.
Raymond Leguy, Instructor.	
Gustav Grünbaum, Instructor.	
<i>German</i>	3 courses.
Henry Wood, Professor.	
<i>History</i>	3 courses
Ralph V. D. Magoffin, Associate.	
Wm. Starr Myers, Instructor in Summer Courses.	
<i>Latin</i>	2 courses.
Ralph V. D. Magoffin, Associate.	
<i>Manual Training</i>	3 courses.
George M. Gaither, Instructor in Summer Courses.	
<i>Mathematics</i>	3 courses.
Eugene R. Smith, Instructor in Summer Courses.	
<i>Physics</i>	6 courses.
A. Herman Pfund, Associate.	
<i>Politics</i>	1 course.
Wm. Starr Myers, Instructor in Summer Courses.	
<i>Spanish</i>	1 course.
Aristogeiton M. Soho, Instructor in Summer Courses.	

Eleven of the Instructors and Assistants were members of the University. To these were added the following representatives of other institutions and school systems: Mr. George M. Gaither, Instructor and Supervisor in the Baltimore Public Schools; Professor Robert M. Gay, of Goucher College; Professor John P. Givler, of Southwestern Kansas College; Director Agnes E. Harris, of the Florida State College for Women; Principal Frances M. Kelsey, of the Indianapolis Public Schools; Professor Florence M. Lane, of the First District Normal School, Kirksville, Missouri; Professor John M. McBryde, of the University of the South; Assistant Professor Wm. Starr Myers, of Princeton University; Dr. Willard S. Small, Principal of the Eastern High School, Washington, D. C.; Mr. Eugene R. Smith, Headmaster of the Park School, Baltimore; Associate Professor George R. M. Wells, of Oberlin College. Owing to serious illness, Assistant Superintendent Josephine B. Stuart, of New Bedford, Massachusetts, was compelled to resign her appointment as Instructor in Education soon after the publication of the circular announcing the Summer Courses. Superintendent Leonora E. Taft, of Woodstock, Vermont, was appointed to give instruction in the courses announced by Miss Stuart. During the fifth week of the Summer Courses M. Raymond Leguy was called to the colors of the French army, and had to relinquish his teaching immediately. Dr. Grünbaum was appointed to continue the instruction in French until the close of the session. The success of the summer work at the University was due to the lively interest and cordial co-operation which all of the Instructors contributed day by day to the realization of the plans which the University had matured for the session.

The enrollment numbered two hundred and eighty-seven. Of these seventy-eight, or 27 per cent., were men, and two hundred and

Subjects and Courses.	Hours of Credit.	Enrollment.	Number Taking Examinations.
Biology			
Botany	2	15	12
Zoology	2	11	9
Chemistry			
Introduction to General Chemistry.....	2½	11	7
Household Chemistry.....	2½	11	8
Organic Chemistry.....	2½	10	10
Laboratory work in Inorganic and Organic Preparations	1	1	1
Domestic Science			
Elementary Cookery.....	1½	9	7
Advanced Cookery.....	1½	11	8
Methods of Teaching Domestic Science...	1	7	6
Education			
Principles of Education.....	1½	18	14
Learning and Tests and Mental Development	1½	6	5
Secondary Education.....	1½	18	11
The Elementary School: Grammar Grades..	1½	14	11
The Elementary School: Primary Grades..	1½	85	82
The Teaching of English and History in the Elementary School.....	1½	45	40
The Teaching of Arithmetic and Geography in the Elementary School.....	1½	18	8
The Rural School: Methods Course.....	1½	58	49
A Demonstration School, Observation Course	1	58	50
English Composition			
Elements of English Composition.....		48	38
Description and Narration.....	1½	18	15
Foundations of English Grammar.....	1½	14	12
English Literature			
Shakespeare	1	8	6
The Greater Romantic Poets.....	1½	28	19
The Novel.....	1½	14	14
Greek Literature in English.....	1½	8	4
French			
Elementary French.....	1½	12	8
Readings in French.....	1½	6	5
French Comedy.....	1½	9	7
German			
Elementary German.....	1½	9	8
Readings in German.....	1½	9	8
Modern German Drama.....	1½	8	5
History			
The History of Greece and Rome.....	1½	17	14
European History since 1815.....	1½	18	10
American History, 1781-1801.....	1½	19	11
Latin			
Caesar		4	3
Horace, Odes and Epodes.....	1½	8	8
Manual Training and Mechanical Drawing			
Elementary Manual Training.....	1½	7	7
Bench Work in Wood and Mechanical Drawing	1½	5	5
Hand-work for Teachers of Backward and Defective Children.....		2	1
Mathematics			
Algebra		7	7
Trigonometry		5	4
Theory and Practice of Teaching Geometry in the Secondary School.....	1½	7	4
Physics			
Elementary Course in General Physics..		4	2
Wave Motion, Sound, and Light.....	1½	4	3
Wave Motion, Sound, and Light: Laboratory Course.....	½	3	3
Mechanics and Heat.....	1	3	2
Mechanics and Heat: Laboratory Course..	½	3	3
Electricity and Magnetism: Laboratory Course	½	3	3
Politics			
Constitutional Government.....	1½	14	10
Spanish			
Elementary Spanish.....	1½	7	5

nine, or 73 per cent., were women. The total number of course registrations was six hundred and seventy-five, the average number of courses taken being 2.35. The distribution of these elections was as follows: one course was taken by forty-three students, two by one hundred and seven, and three by one hundred and thirty-eight. Two hundred and two, or nearly 70.4 per cent. of the students, were teachers or supervisory and administrative officers of public and private schools, normal schools and colleges; forty-two, or 14.6 per cent., were students in secondary schools and colleges; twenty-one, or 7.3 per cent., represented twelve other occupations, and twenty-two, or nearly 7.7 per cent., were engaged in no occupation. Fifty-one, or 17 per cent., had academic or professional degrees from twenty-seven colleges. The geographical distribution of the students was as follows: Maryland was represented by two hundred and fifty-five, or 88 per cent.; fourteen other states and the District of Columbia by thirty-two, or 12 per cent.; and of the twenty-three counties in Maryland, nineteen were represented.

The table on page 74 presents a ready survey of the work done by the students in so far as this may be gathered from a list of the courses given in the several subjects, the courses allowed academic credit, the enrollment in each, and the number taking the examinations at the close of the session.

It is gratifying to be able to record that the earnestness of the students in the fourth session more than maintained the unusually high level of the former sessions. Ninety-eight per cent. were entitled to certificates of attendance or examination; and 86.7 per cent. of the registration remained to complete their work by taking the examinations at the close of the session.

As a means of relaxation from the serious work of study and instruction, as well as of meeting the social needs of a large company of persons assembled at the University, a series of lectures and entertainments was given on Friday evenings. As in former years, these were open to the public. They were made especially attractive through the co-operation of the Summer Session of the Peabody Conservatory of Music. Each lecture in McCoy Hall was preceded by a musical program under the direction of Mr. Frederick R. Huber, Director of the Peabody Summer Session. The audiences were uniformly large and appreciative. The programs were as follows:

- July 10—Professor David M. Robinson, of the University.
"A Visit to Asia Minor." (Illustrated.)
- July 17—Mr. George F. Boyle, pianist, and
Mr. J. C. Van Hulsteyn, violinist, of the Conservatory.
Recital.
- July 24—Dr. August H. Pfund, of the University.
"Liquid Air," (with experimental demonstrations).
- July 31—Mr. Frederick D. Weaver, organist, and
Mr. Bart Wirtz, 'cellist, of the Conservatory.
Recital.
- August 7—Professor John M. McBryde, Jr., of the University of the South.
"Through the Country of Scott, Burns, and Shakespeare." (Illustrated.)

A new series of public lectures on "The History of Music" by Mr. Charles H. Bochau were given on Monday and Thursday afternoons at the Conservatory. In carrying out the following program, Mr. Bochau was assisted by Miss Frances W. Morrow, soprano; Miss Florence R. Moltz, contralto; Mr. Oscar H. Lehman, tenor; Mr. Walter Johnson, baritone; Mr. Frederick D. Weaver, pianist; and Mr. Abraham Goldfuss, violinist.

July 2—Music of the Ancients and the Beginning of Polyphony.

July 6—The Development of Vocal Polyphony.

July 9—The Reformation and the Renaissance.

July 13—Folk-songs during the Middle Ages.

July 16—The Birth of Oratorio.

July 20—Bach and Handel.

July 23—The Development of Instruments and Instrumental Music.

July 27—The Opera in the 17th and 18th Centuries.

July 30—Haydn, Mozart and Beethoven.

August 3—The Beginning and Development of Romanticism.

August 6—Opera-composers in the 19th Century.

August 10—Contemporary Composers.

The social welfare of the members of the session received attention. The Directors gave a reception to the two faculties at the Johns Hopkins Club, Monday evening, July 6. Opening and Closing Receptions by the University and the Conservatory were given in McCoy Hall to the faculties and students on Friday evenings, July 10 and August 7. Saturday excursions were taken to Annapolis on July 18 on invitation of Dr. M. Bates Stephens, State Superintendent of Education, and to Washington on August 1 on invitation of Dr. P. P. Claxton, United States Commissioner of Education. A visit to the Art Gallery and Library of the Peabody Institute was made on July 25 on the invitation of Mr. L. H. Dielman. The Archaeological Collection of the University was visited under the direction of Dr. R. V. D. Magoffin on August 8.

Out of the wider knowledge about the summer work conducted at the University there has appeared a considerable increase in the number of teachers and students who are anxious to utilize the session for the purpose of promoting their advanced studies, both with and without reference to an advanced degree. In justice to itself the University must add, sooner or later, a program of graduate instruction and thereby complete in a very significant way the appeal which it is offering anew to the educational interests of the country.

EDWARD F. BUCHNER,
Director.

REPORT OF THE DEAN OF THE MEDICAL FACULTY

TO THE ADMINISTRATIVE COMMITTEE OF THE FACULTY:

I have the honor to submit the following report of the activities of the Medical Department during the academic year extending from October, 1913, to July, 1914.

The total enrollment of candidates for the degree of doctor of medicine was 360. Six students withdrew—four on account of ill health and two from other causes—making the enrollment at the end of the year 354. Twenty physicians registered for special instruction in various branches of medicine during the school year.

In co-operation with the Johns Hopkins Hospital, summer courses in various departments of Medicine and Surgery were offered to graduates in medicine during the six weeks beginning Monday, June 1, 1914. Sixty-nine physicians were enrolled in these courses.

One hundred and fifty applications for admission were received at the beginning of the 1913 session and ninety-eight were accepted. Nine of the first-year students were admitted with conditions in the following subjects: laboratory physics (3), French (3), German (3).

All of the regular courses announced in the catalogue have been given. In addition to the work of instruction, the teaching staff as well as our alumni and students have been active contributors to medical literature, as is shown by the fact that their publications during the year ending July 1, 1914, aggregated 907. These contributions have been collected and bound, and constitute a valuable addition to our library.

The health of the student-body during the year has been very satisfactory. Careful physical examination of the incoming students has been conducted as in previous years. Of the ninety-eight students examined, ten were in need of special supervision but none were seriously sick.

The most important occurrence of the year was the establishment in October, 1913, of the William H. Welch Fund for Clinical Education and Research by the General Education Board. This generous addition to our endowment has made it possible to place the departments of Medicine, Surgery, and Pediatrics upon the full University basis. In accordance with the terms of the gift, the responsible members of each staff are expected to give their entire time to the Medical School and Hospital and not to engage in private practice. Drs. Halsted and Howland accepted the headship of the departments of Surgery and Pediatrics respectively. In Medicine, it was not possible for Dr. Thayer or Dr. Barker to take such a step, and consequently they were made Professors of Clinical Medicine, and Dr. Theodore C. Janeway, Bard Professor of Medicine at Columbia University, was offered and accepted the leadership of this department and assumed its duties September 15, 1914.

The placing of these clinical departments of the Medical School upon the full University basis constitutes one of the most important advances made in the teaching of clinical medicine, and cannot fail to have far reaching effects both in this school and throughout the country. The change, however, makes a great contrast between these departments and the other main clinical departments of the Medical School which are not so organized, and renders it imperative upon the authorities of the University to extend the system to them as soon as possible.

I would furthermore call attention to the great need of suitable athletic grounds and a club house for the medical students. Many of the men come here after an athletic life in college towns and live under more or less unhygienic conditions in boarding houses in the neighborhood of the Hospital, where there are no facilities for exercise of any kind, and the contrast between their present and former mode of living often results in a deterioration in their health. A committee consisting of Mr. White and Drs. Finney and Whipple were appointed to consider what might be done in the matter, but as yet it has been impossible to take any step forward.

I regret to report that two members of the teaching staff died during the year, viz., Dr. Edward B. Huey, Assistant in Psychiatry, January 12, and Dr. R. A. Urquhart, Instructor in Pediatrics, April 22; also three alumni, Dr. George B. Scholl (1902), July 9, 1914; Dr. Leigh S. Krake (1914), July 9, 1914; and Dr. Charles S. Little (1899), December 13, 1913.

The following members of the teaching staff resigned during the session:

- Dr. Lewellys F. Barker, Professor of Medicine, to become Professor of Clinical Medicine.
- Dr. Leonard G. Rowntree, Associate Professor of Experimental Therapeutics, to become Associate Professor of Medicine.
- Dr. George H. Whipple, Associate Professor of Pathology, to become Director of the Hooper Institute for Research, University of California.
- Dr. Eliot R. Clark, Associate in Anatomy, to become Professor of Anatomy, University of Missouri, Columbia.
- Dr. Eli K. Marshall, Jr., Associate in Physiological Chemistry, to become Associate in Pharmacology.
- Dr. Henry A. Stephenson, Instructor in Obstetrics, to become Associate in Obstetrics and Gynecology, Leland Stanford Junior University, California.
- Dr. Edward M. Singewald, Instructor in Neurology.
- Dr. Harry S. Greenbaum, Instructor in Medicine.
- Dr. George W. Corner, Assistant in Anatomy, to become Assistant Resident Gynecologist, Johns Hopkins Hospital.
- Dr. Daniel Davis, Assistant in Physiology, to become Interne in Obstetrics, Johns Hopkins Hospital.
- Dr. David M. Davis, Assistant in Pathology, to become Instructor in Urology.
- Dr. Benjamin S. Kline, Assistant in Pathology, to become Fellow, Rockefeller Institute for Medical Research.
- Dr. Solon A. Dodds, Assistant in Obstetrics.

The following new appointments were made:

- Dr. Theodore C. Janeway, Professor of Medicine.

Dr. Herman O. Mosenthal, Associate Professor of Medicine.
Dr. Charles R. Austrian, Associate in Medicine.
Dr. Lewis H. Weed, Instructor in Anatomy.
Dr. Ernest W. Goodpasture, Instructor in Pathology.
Dr. D. Sclater Lewis, Instructor in Medicine.
Dr. R. W. B. Mayo, Instructor in Clinical Medicine.
Dr. Mont R. Reid, Instructor in Surgery.
Dr. Felix Landois, Instructor in Surgery.
Dr. George E. Bennett, Instructor in Clinical Surgery.
Dr. James R. Miller, Instructor in Clinical Obstetrics.
Dr. Charles C. Macklin, Assistant in Anatomy.
Dr. Harry R. Muller, Assistant in Anatomy.
Dr. D. Wright Wilson, Assistant in Physiological Chemistry.
Dr. Charles A. Rouiller, Assistant in Pharmacology.
Dr. Alice Rhodé, Assistant in Pharmacology.
Dr. Harry C. Schmeisser, Assistant in Pathology.
Dr. Thornton Stearns, Assistant in Pathology.
Dr. George Minot, Assistant in Medicine.
Dr. Robert L. Levy, Assistant in Medicine.
Dr. Norman M. Keith, Assistant in Medicine.
Dr. Annabella E. Richards, Assistant in Medicine.
Dr. F. Janney Smith, Assistant in Medicine.
Dr. LeRoy N. Fleming, Assistant in Surgery.
Dr. Henry W. Cave, Assistant in Surgery.
Dr. Willa M. Fricke, Assistant in Obstetrics.
Dr. J. Scott Willock, Assistant in Clinical Dermatology.
Dr. Lloyd W. Ketron, Assistant in Clinical Dermatology.

Upon the recommendation of the Advisory Board of the Medical Faculty, the University conferred the degree of Doctor of Medicine upon ninety students at the Commencement exercises held June 9, 1914.

The following fifteen members of the graduating class were recommended to the Trustees of the Johns Hopkins Hospital for appointment as House Officers, the recommendations being based upon excellence of scholarship throughout the medical course: Drs. Grover A. Batten, Stanhope Bayne-Jones, Mildred Clark, John C. Donaldson, George R. Dunn, Frank A. Evans, Morris Flexner, John T. King, Jr., John K. Ormond, Leslie H. Redelings, Alma S. Rothholz, Joseph Webb, Jerome P. Webster, Herbert M. N. Wynne and Isadore Zadek.

The positions obtained by other members of this class, either by appointment or by competitive examination, are as follows:

Mabel Belt.—Interne, Hospital for Women of Maryland, Baltimore.
R. B. Bettman.—Interne, Michael Reese Hospital, Chicago.
J. B. Boehm.—Interne, Peter Bent Brigham Hospital, Boston.
Kate B. Bogle.—Interne, Garfield Memorial Hospital, Washington.
E. S. duBray.—Interne, City Hospital, Boston.
N. H. Brush.—Interne, Phipps Psychiatric Clinic.
F. P. Carroll.—Interne, St. Agnes Hospital, Baltimore.
D. W. Carter, Jr.—Interne, Peter Bent Brigham Hospital, Boston.
Dorothy Child.—Interne, Woman's Hospital, Philadelphia.
H. S. Colwell.—Interne, Massachusetts General Hospital, Boston.
C. E. Connor.—Interne, Rhode Island Hospital, Providence.
R. H. Crawford.—Interne, Union Protestant Infirmary.

- I. Davis.—Interne, St. Francis Hospital, Pittsburgh.
 R. M. Dodson.—Interne, Bellevue Hospital, New York.
 H. B. Dornblaser.—Interne, Hospital for Women of Maryland, Baltimore.
 C. A. Downs.—Interne, Hartford Hospital, Conn.
 E. F. Ducasse.—Interne, City Hospital, Boston.
 W. C. Duffy.—Interne, City Hospital, Bay View.
 J. B. Duncan.—Interne, Jefferson Surgical Hospital, Roanoke, Va.
 Avis C. Eaton.—Interne, Hospital for Children, San Francisco, Cal.
 M. W. Emrick.—Resident Physician, Lancaster General Hospital, Pa.
 T. S. Englar.—Resident Physician, Kansas City General Hospital, Mo.
 W. A. Fansler.—Instructor in Pathology and Bacteriology, Marquette University, Milwaukee.
 A. G. Fechtig.—Interne, J. Hood Wright Memorial Hospital, New York.
 J. G. Fergusson.—Interne, Roosevelt Hospital, New York.
 L. N. Fleming.—Assistant in Surgery.
 Mary L. Frazee.—Interne, Bloomingdale Hospital, White Plains, N. Y.
 H. B. Gardner.—Interne, St. Francis Hospital, Pittsburgh, Pa.
 F. Grave.—Interne, City and County Hospital, St. Paul, Minn.
 H. J. Hagan.—Interne, Jefferson Surgical Hospital, Roanoke, Va.
 R. F. Hain.—Interne, Church Home and Infirmary, Baltimore.
 R. C. Hall.—Interne, Bellevue Hospital, New York.
 H. H. Hampton.—Interne, Church Home and Infirmary, Baltimore.
 B. E. Harrell.—Interne, Jefferson Surgical Hospital, Roanoke, Va.
 W. C. Haupt.—Assistant Physician, Butler Hospital, Providence, R. I.
 Mary A. Hodge.—Dispensary Physician, Johns Hopkins Hospital.
 C. W. Hooper.—Assistant, Hooper Institute for Medical Research, University of California.
 L. F. Huffman.—Interne, Lakeside Hospital, Cleveland.
 J. E. Hutchinson.—Interne, Hartford Hospital, Conn.
 Ruth Ingraham.—Interne, Woman's Hospital, Philadelphia.
 W. D. Jack.—Interne, Peter Bent Brigham Hospital, Boston.
 W. F. Jones.—Interne, French Hospital, New York.
 W. S. Keister.—U. S. Marine Hospital, Wilmington, N. C.
 C. C. Kelly.—Interne, Methodist Episcopal Hospital, Brooklyn, N. Y.
 C. S. Ketcham.—Interne, Union Protestant Infirmary, Baltimore.
 Caroline McGill.—Pathologist, Murray Hospital, Butte, Mont.
 F. A. Martin.—Instructor in Pathology and Bacteriology, University of Missouri, Columbia.
 N. C. Marvel.—Interne, Hospital for Women of Maryland, Baltimore.
 J. Meyer.—Medical House Officer, Washington University Hospital, St. Louis, Mo.
 R. E. Mosiman.—Interne, Lakeside Hospital, Cleveland, O.
 J. S. Plumer.—Interne, Allegheny General Hospital, Pittsburgh.
 J. D. Reichard.—Interne, Church Home and Infirmary, Baltimore.
 F. O. W. Reinhard.—Interne, Children's Hospital School, Baltimore.
 A. Robinson.—Interne, Hebrew Hospital, Baltimore.
 Ethel M. Rockwood.—Interne, Memorial Hospital, Worcester, Mass.
 H. Saltstein.—Interne, Mt. Sinai Hospital, New York.
 J. J. S. Schmitt.—Assistant Surgeon, U. S. P. H. S., Wilmington, N. C.

- J. H. Sewell.—Interne, City Hospital, Bay View.
F. E. Shaffer.—Resident Physician, German Hospital, Philadelphia.
J. L. Sherrick.—Interne, Massachusetts General Hospital, Boston.
L. B. Sherry.—Interne, Lakeside Hospital, Cleveland.
R. L. Silvester.—Interne, Hospital for Women of Maryland, Baltimore.
L. E. Stubbs.—Interne, Garfield Memorial Hospital, Washington, D. C.
H. D. Taylor.—Professor of Bacteriology and Pathology, Wake Forest College, N. C.
O. E. Utzinger.—Interne, Union Protestant Infirmary, Baltimore.
J. S. Vanneman.—Interne, Church Home and Infirmary, Baltimore.
L. Van Valzah.—Interne, Southern Pacific Hospital, San Francisco.
J. M. Venable.—Interne, St. Luke's Hospital, New York.
R. C. Webb.—Interne, New York Hospital, N. Y.
H. E. Wilson.—Assistant Physician, Greensboro Hospital, N. C.
S. B. Wolff.—Interne, Bellevue Hospital, New York.
E. B. Wood.—Interne, Lakeside Hospital, Cleveland, O.
A. C. Woods.—Interne, Peter Bent Brigham Hospital, Boston.

J. WHITRIDGE WILLIAMS,
Dean of the Medical Faculty.

REPORT ON THE DEPARTMENT OF ENGINEERING

TO THE ADMINISTRATIVE COMMITTEE OF THE FACULTY:

The following statements regarding the organization and development of the Department of Engineering are respectfully submitted:

CIVIL ENGINEERING

Instruction in Civil Engineering began with the opening of the University in October. Three undergraduate courses were given by Professor Tilden as follows:

Engineering Drawing—Saturday mornings, 9 to 1, from October to March. This was given for a class of thirty-four students, most of whom were registered as second-year students in the Department of Engineering.

Civil Engineering 1—Structural Mechanics, Theory of the Strength of Materials and Elements of Structural Design. Three meetings a week throughout the year and one afternoon a week in the drafting room from December to June. Eight students enrolled in the course, four of whom completed the work in June with a satisfactory grade; these were all men who had received a baccalaureate degree from this or some other University but were registered in the Junior year of the Department of Engineering. Of the remaining four, three dropped the course at the end of three weeks on account of lack of preparation and the fourth changed to another department of the University.

Surveying—Field work in the use of instruments and taking notes and practice on the drawing board in plotting notes, computing areas, etc. This course was given at Homewood six days a week from June 4th to July 3d, inclusive, with the exception of June 9, Commencement Day. Headquarters for the work were established in the gymnasium building back of the Old Carroll Mansion, where lockers, shower baths, etc., provided conveniences which were much appreciated by the students. Drawing tables were put in the main room of the gymnasium, making a very satisfactory office. Twenty-three students began the work and seventeen of these finished satisfactorily, the remainder were forced to leave on account of being dropped from the University for failure in their June examinations or else to take up summer work by which they could earn money. In conducting this class in Surveying at Homewood, Professor Tilden was assisted by Mr. J. S. Gorsuch, a graduate of the Maryland Agricultural College, who has had considerable experience on railroad surveys.

During the college year, the classes in Civil Engineering were held in the Physical Laboratory at the corner of Monument Street and Linden Avenue. This was due to the courtesy and hospitality of Professor Joseph S. Ames, Director of the Physical Laboratory, who very kindly made room in his building for the three professors

of Engineering, pending the completion of the Mechanical and Electrical Laboratory at Homewood. Owing to the lack of testing machines and other apparatus for demonstrating the strength of materials, it was not possible to give laboratory work in connection with the class work in Civil Engineering I. As a substitute for this, however, a certain amount of work on the drawing board was required and this was made to supplement, as far as possible, the lectures and reading.

Publications by Professor Tilden during the year:

Kinetic Effects of Crowds. (Trans. Am. Soc., Vol. LXXVI, December, 1913.)

The Course in Civil Engineering. (Johns Hopkins Alumni Magazine, June, 1914.)

A large part of the time of the professor of Civil Engineering was spent in choosing and purchasing surveying equipment, testing machines for the materials testing laboratory at Homewood and in collecting books, magazines, photographs and blue prints to form the nucleus of a working library. These were stored in the Physical Laboratory until such time as the library of the new building at Homewood should be ready to receive them. A good deal of study was given to the subject of the proposed building for Civil Engineering at Homewood, which is to be located facing the Mechanical and Electrical Building, to the west of the latter. A "programme" of the needs to be met in such a building was prepared, together with tentative studies of floor-plans, etc., for submission to the architect when he shall be selected.

ELECTRICAL ENGINEERING

The following courses in Electrical Engineering were given by Professor Whitehead:

(1) Alternating Current Theory. *Two hours weekly through the year.*

(2) Continuous Current Machinery. *Two hours weekly through the year.*

These courses were attended by graduate students offering Electrical Engineering as a subordinate subject. No undergraduate courses were given, the first class in the Department of Engineering not having advanced to its third year. All classes through the courtesy of Professor Ames were conducted in the Physical Laboratory.

The laboratory work has also been carried on in the Physical Laboratory under the general supervision of Mr. M. W. Pullen.

Two candidates for the degree of Doctor of Philosophy, with Physics as principal subject, selected problems in Applied Electricity for the experimental work leading to their dissertations. The authors and the titles of their dissertations are as follows:

Mr. W. S. Gorton—"The Influence of Frequency on the High Voltage Corona."

Mr. Donald McKenzie—"The Corona at Continuous Potentials."

Professor Whitehead has with the assistance of Mr. Pullen con-

tinued his investigation of the Ionization of Air. He has published the following papers:

"The Electric Strength of Air-V" (with Mr. W. S. Gorton), (Proceedings, A. I. E. E., June, 1914, Page 915.)

"A Department of Engineering in Johns Hopkins University." (Bulletin of Society for the Promotion of Engineering Education, Volume IV, No. 10, 1914.)

"A Department of Engineering." (Johns Hopkins Alumni Magazine, Volume II, No. 2, January, 1914.)

Professor Whitehead has also continued his active relations with the American Institute of Electrical Engineers during the year and was reappointed Chairman of the Electrophysics Committee of that body. The Baltimore Section of the Institute has held its monthly meetings through the year in the Physical Laboratory.

The construction of the new laboratory of Mechanical and Electrical Engineering at Homewood has been begun and is well advanced towards completion. Much attention has been given to the details of this work and to the choice and purchase of the equipment of the building.

MECHANICAL ENGINEERING

During the college year 1913-14 the activities of Professor Thomas were directed along the following principal lines: (a) Instruction, (b) Planning of the new buildings and equipment at Homewood in conjunction with others in the Department of Engineering and with contractors and manufacturers, (c) Preparation and presentation of technical papers and general addresses.

(a) Instruction: A course was given in elementary Thermodynamics throughout the year, four lecture hours each week. The class consisted of six graduates from four-year courses in this or in other institutions. One of these men was obliged to drop the course because of lack of preparation and one will repeat the course. The work given was part of the regular course called Mechanical Engineering I, taken as part of the regular third-year course for engineering students. In the future, this work will include not only the four lecture hours per week, but also three afternoon laboratory periods per week.

During the second half-year a course in Kinematics was given to thirty-four second-year students. This course is a continuation of Engineering Drawing taken by all second-year students of Engineering. The time allotted to the course was one four-hour period per week.

(b) Planning of new buildings and equipment: A large portion of the time of Professor Thomas was given to problems connected with building and equipping the Engineering Building, Power House and Mechanical Laboratory. In order to avoid the expense which would have been incurred if the mechanical laboratory had been built up independently of the power station, and in order to provide the present unique facilities for instruction and research in mechanical engineering, it was decided to equip the power station so that practically all of the machinery installed could be scientifically tested. The Power House was extended thirty feet towards the north so as to include a Gas Engine Laboratory, and space for other

equipment which would have been out-of-place and inconvenient in the Machinery Hall of the main engineering building. Careful study was given to the selection of such equipment as would contribute not only to advanced instruction and research along important lines of modern industry, but which would also be particularly suited to giving undergraduate instruction with the least possible laboratory expense.

The Allis-Chalmers Manufacturing Company, of Milwaukee, presented to the laboratory, in the form of an indefinite loan, a Diesel oil engine of 75 H. P., and has provided for assisting materially in important investigations on the use of American fuel oils. The Ingersoll-Rand Company, The Frick Ice Machine Company, The Cutler-Hammer Manufacturing Company and several other manufacturers supplied machines and other apparatus at exceedingly low prices, and have expressed their great interest in the research work which is to be done in the laboratories.

(c) Professor Thomas prepared and presented before the American Society of Mechanical Engineers a paper giving the results of four years' research work done at the University of Wisconsin on "Comparative Tests of Three Types of Shaft Bearings." In addition to this, various minor articles were prepared, including a description of the engineering laboratories at Homewood, for the Alumni Magazine, a talk before the Engineers' Club of Baltimore and the Commencement address for the graduating exercises of the Baltimore Polytechnic Institute.

C. J. TILDEN,
Professor of Civil Engineering.

J. B. WHITEHEAD,
Professor of Electrical Engineering.

C. C. THOMAS,
Professor of Mechanical Engineering.

SCHOLARSHIPS IN THE DEPARTMENT OF ENGINEERING, 1913-14

<i>Name</i>	<i>Residence</i>	<i>Type of Scholarship.</i>
Allen, H. H.	Baltimore County	Md. Agricul. College.
Barron, D. H.	Baltimore City	Trustees' 1912-13
Brumbaugh, I. V.	Caroline County	Senatorial
Bryan, G. L.	Dorchester County	Senatorial
Burris, J. L.	Kent County	Senatorial
Campbell, A. L.	Baltimore County	Trustees' 1912-13
Cecil, W. D.	Queen Anne's County	Senatorial
Chesley, C. W.	St. Mary's County	Senatorial
Cockey, Jas. P.	Baltimore County	Trustees' 1912-13
Cohen, H. A.	Baltimore City	Ordinary
Cohn, R. A.	Baltimore City	At Large
Courtney, N. C.	Harford County	Trustees' 1912-13
Darley, J. W.	Baltimore City	Western Md. College.
Davis, E. S.	Baltimore County	Ordinary
Defendorf, J. L.	Montgomery County	Senatorial
Doub, C. L.	Frederick County	Senatorial
Dryden, G. E.	Worcester County	Senatorial
Evitt, R. W.	Baltimore County	Trustees' 1912-13

<i>Name</i>	<i>Residence</i>	<i>Type of Scholarship.</i>
Fitzgerald, W. S.	Somerset County	Senatorial
Gladden, A. A.	Anne Arundel County	Senatorial
Gorsuch, J. S.	Baltimore County	Md. Agricul. College.
Hall, E. G.	Baltimore City	Ordinary
Heimer, R. C.	Frederick County	Ordinary
Hutton, U. O.	Montgomery County	At Large
Iddings, F. T.	Howard County	Trustees' 1912-13
Johnston, D. H., Jr.	Baltimore City	Trustees' 1912-13
Junkins, A. B.	Baltimore City	Senatorial
Lampe, D.	Baltimore County	At Large
Lednum, J. M.	Caroline County	Ordinary
Leithiser, S. L.	Harford County	Trustees' 1912-13
Levin, L.	Baltimore City	Ordinary
Levin, M.	Baltimore City	Ordinary
Lyness, A. A.	Baltimore City	Loyola College
Melamet, O.	Baltimore City	Trustees' 1912-13
Owings, N. L.	Baltimore City	Senatorial
Perkins, E. E.	Prince George's County	Senatorial
Pratt, W. B.	Cecil County	Senatorial
Reier, G. C.	Baltimore County	Washington College
Reiner, M.	Baltimore City	Ordinary
Roop, J. D., Jr.	Carroll County	Senatorial
Schmidt, H. E.	Baltimore County	Trustees' 1912-13
Sebold, J. G.	Frederick County	Mt. St. Mary's Coll.
Smith, E. L.	Harford County	Trustees' 1912-13
Stapleton, E. G.	Baltimore County	Senatorial
Stuart, E. M.	Baltimore City	Trustees' 1913-14
Thompson, J. T.	Baltimore City	At Large
Tobias, A.	Baltimore City	Trustees' 1912-13
Twigg, J. M.	Allegany County	Senatorial
Vickers, L. R.	Dorchester County	Trustees' 1912-13
Wacker, H., Jr.	Baltimore City	Ordinary
Watson, J. S.	Charles County	Senatorial
Webb, W. D.	Harford County	Senatorial
Webster, J. G.	Baltimore City	Trustees' 1912-13
Winslow, G. L.	Baltimore City	St. John's College
Wood, W. A., Jr.	Baltimore County	Trustees' 1912-13
Young, L. McC.	Washington County	Senatorial

REPORT OF THE REGISTRAR

TO THE ADMINISTRATIVE COMMITTEE OF THE FACULTY:

During the year 1913-14 the academic staff included two hundred and fifteen teachers, eighty-four in the philosophical and engineering departments and one hundred and thirty-one whose work lay wholly or chiefly in medicine. There were also thirty lecturers, most of them non-resident, who gave single lectures or short courses. The number of students enrolled in the regular courses was eight hundred and seventy, of whom four hundred and thirty-six were residents of Maryland, four hundred and twenty came here from forty-one other States and Territories of the Union, and fourteen from foreign countries. Among the students were six hundred and seven already graduated, of whom two hundred and thirteen were enrolled in the department of Philosophy and the Arts (including forty women), three hundred and seventy-eight in the department of Medicine (including thirty-five women), and sixteen in the department of Engineering. There were one hundred and seventy candidates for the degree of Bachelor of Arts, seventy-nine candidates for a degree in Engineering, and fourteen were enrolled as special students, pursuing courses of study for which they seemed fitted, without reference to graduation. The college courses for teachers were attended by one hundred and sixty-seven persons; the summer college courses of 1913 by two hundred and seventy-seven; the summer courses for physicians (1913) by seventy. The enrolment for the year is summarized below:

Faculty

President and Professors.....	61
Clinical Professors.....	6
Associate Professors.....	30
Associates	36
Instructors and Assistants.....	82
	215
Lecturers for the year.....	30

Students

I. Graduate Students:

A. Department of Philosophy:

1. Fellows by Courtesy.....	12
2. Fellows:	
University	19
Adam T. Bruce.....	1
William S. Rayner.....	1
Edmund Law Rogers.....	1
3. George Peabody Scholar.....	1

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4. Other Graduate Students:		
a. Candidates for higher degrees.....	126	
b. Special Students.....	52	
		<hr/> 218
B. Department of Medicine:		
1. Candidates for the degree of Doctor of Medicine	360	
2. Physicians attending Special Courses.....	18	
		<hr/> 378
C. Department of Engineering:		
1. Candidates for the degree of Master in Electrical Engineering, etc.....	1	
2. Candidates for the degree of Bachelor of Science	15	
		<hr/> 16
II. Undergraduate Students:		
1. Candidates for the degree of Bachelor of Arts..	184	
2. Candidates for the degree of Bachelor of Science	61	
3. Candidates for matriculation.....	54	
4. Special Students.....	14	
		<hr/> 263
Total		<hr/> 870
III. Attendants on College Courses for Teachers.....	167	
IV. Attendants on Summer Courses:		
1. Courses for Physicians.....	70	
2. College Courses.....	277	
		<hr/> 514
Total receiving instruction.....	1884	
Counted twice.....	59	
Net total.....		<hr/> 1825

During the past thirty-eight years, seven thousand six hundred and seventy-five individuals have been enrolled as students in the regular sessions. Of these two thousand nine hundred and seventy-seven are registered as from Maryland (including two thousand three hundred and thirty-six from Baltimore), and four thousand six hundred and ninety-eight from eighty-three other States and countries. Five thousand two hundred and ninety persons entered as graduate students, and two thousand three hundred and eighty-five as undergraduates. Of the undergraduates, six hundred and thirty-nine have continued as graduate students, many of them proceeding to higher degrees. It thus appears that five thousand nine hundred and twenty-nine persons have followed graduate studies here. The following table shows the enrolment of students:

Report of the Registrar

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	Total*	Graduates (Inc. Fellows)	Undergraduates		College Courses for Teach- ers	Summer Courses
			Candidates for Degrees	Special		
1876-77	89	54	12	23		
1877-78	104	58	24	22		
1878-79	123	63	25	25		
1879-80	159	79	32	48		
1880-81	176	102	27	37		
1881-82	175	99	45	31		
1882-83	204	125	49	30		
1883-84	249	169	53	37		
1884-85	290	174	69	47		
1885-86	314	184	96	34		
1886-87	378	228	108	42		
1887-88	420	281 { Phil., 220 Med., 11	127	62		
1888-89	394	216 { Phil., 202 Med., 14	129	49		
1889-90	404	229 { Phil., 209 Med., 20	130	45		
1890-91	468	276 { Phil., 233 Med., 43	141	51		
1891-92	547	337 { Phil., 298 Med., 39	140	70		
1892-93	551	347 { Phil., 297 Med., 50	133	71		
1893-94	532	344 { Phil., 261 Med., 83	123	55		
1894-95	589	412 { Phil., 284 Med., 128	126	51		
1895-96	596	406 { Phil., 253 Med., 153	149	41		
1896-97	520	344 { Phil., 310 Med., 134	144	32		
1897-98	641	456 { Phil., 315 Med., 241	152	33		
1898-99	649	462 { Phil., 310 Med., 252	163	24		
1899-1900	645	469 { Phil., 335 Med., 234	159	17		
1900-01	651	473 { Phil., 368 Med., 305	158	20		
1901-02	694	530 { Phil., 372 Med., 358	158	6		
1902-03	695	532 { Phil., 387 Med., 345	147	16		
1903-04	715	556 { Phil., 402 Med., 354	141	18		
1904-05	746	563 { Phil., 435 Med., 328	160	23		
1905-06	720	530 { Phil., 462 Med., 368	163	27		
1906-07	671	504 { Phil., 458 Med., 346	146	21		
1907-08	683	513 { Phil., 471 Med., 347	142	23		
1908-09	731	562 { Phil., 487 Med., 375	133	31		
1909-10	821	595 { Phil., 488 Med., 407	143	14	69	
1910-11	916	625 { Phil., 510 Med., 415	180	16	101	
1911-12	1206	623 { Phil., 517 Med., 406	170	9	113	225†
1912-13	1090	600 { Phil., 515 Med., 385	192 { A. B., 165 S. B., 27	8	119	201
1913-14	1325	607 { Phil., 513 Eng., 16 Med., 378	249 { A. B., 170 S. B., 79	14	167	247 { Coll., 277 Med., 70

* Excluding duplicates.

† Summer of 1911.

The geographical distribution of the students in the regular courses is shown by the following table:

	From Maryland.	From Other States and Countries.		From Maryland.	From Other States and Countries.
1876-77	69	30	1895-96	272	324
1877-78	71	33	1896-97	254	266
1878-79	76	47	1897-98	270	362
1879-80	97	63	1898-99	277	272
1880-81	95	81	1899-1900	262	383
1881-82	97	78	1900-01	270	381
1882-83	106	98	1901-02	278	421
1883-84	123	126	1902-03	283	412
1884-85	130	160	1903-04	294	421
1885-86	130	184	1904-05	312	434
1886-87	162	216	1905-06	304	416
1887-88	199	221	1906-07	257	414
1888-89	183	211	1907-08	267	416
1889-90	215	189	1908-09	311	420
1890-91	235	233	1909-10	286	466
1891-92	273	274	1910-11	337	478
1892-93	266	285	1911-12	337	465
1893-94	260	262	1912-13	358	442
1894-95	260	329	1913-14	436	420

The enrolment in the medical department, not including the summer courses, has been as follows:

	Candidates for M. D.	Drs. of Med.	Total.		Candidates for M. D.	Drs. of Med.	Total.
1893-94	13	65	83	1904-05	291	77	368
1894-95	51	77	128	1905-06	293	75	368
1895-96	84	69	153	1906-07	263	83	346
1896-97	123	11	134	1907-08	277	70	347
1897-98	167	74	241	1908-09	297	78	375
1898-99	197	55	252	1909-10	334	78	407
1899-1900	211	73	284	1910-11	351	65	416
1900-01	209	96	306	1911-12	355	51	406
1901-02	229	129	358	1912-13	351	34	385
1902-03	256	89	345	1913-14	360	18	378
1903-04	276	78	354				

The attendance upon the regular graduate and undergraduate courses has been as follows during the last five years:

	1909-10	1910-11	1911-12	1912-13	1913-14
Mathematics	87	98	82	104	174
Physics	79	95	102	182	177
Chemistry	116	147	125	110	120
Geology and Mineralogy	81	43	47	51	57
Zoology, Botany, Plant Physiology	77	67	68	66	85
Greek	32	84	33	41	51
Latin	63	62	74	56	74
Classical Archaeology and Art	13	28	42	24	35
Sanskrit and Comparative Philology	13	18	24	27	26
Semitic Languages	16	22	26	16	22
English	156	185	163	191	251
German	63	95	115	104	116
French, Italian and Spanish	108	116	120	127	149
History	76	74	83	91	85
Political Economy	54	72	105	104	90
Political Science	23	28	31	35	24
Philosophy, Psychology and Education	36	65	72	73	75
Engineering (Civil, Elec. and Mech.)	...	...	...	...	47

The following tables record the enrolment in the College Courses for Teachers and in the Summer Courses since their initiation:

Report of the Registrar

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College Courses for Teachers

	1909-10	1910-11	1911-12	1912-13	1913-14
Mathematics	9	15	6		
Chemistry		10			6
Biology	8	4			
Latin	8		6	4	6
Hebrew				1	
English Composition	29	28	36	26	27
English Literature	16	8	22	32	49
German	4	6	9	22	25
French	2	5	12	17	35
History	7	15	12	4	8
Education		14	21	21	21
Psychology				7	9

Summer Courses

	1911	1912	1913
Mathematics	23	8	9
Physics	14	11	7
Chemistry	25	29	41
Biology	59	9	19
Latin	22	9	12
English Composition	121	65	51
English Literature	48	39	37
German	33	24	20
French	26	26	15
History	56	31	50
Education	172	95	148
Domestic Science	24	15	27
Manual Training	26	4	19
Politics			9

Degrees were conferred during the year upon one hundred and eighty-six candidates—Bachelor of Arts, fifty-two; Masters of Arts, thirteen; Doctors of Philosophy, thirty; Doctors of Medicine, ninety-one. Since degrees were first conferred, in 1878, twelve hundred and twenty persons have attained the Baccalaureate degree, forty-seven (including twelve women) the degree of Master of Arts, nine hundred and fifty-eight (including fourteen women) the degree of Doctor of Philosophy, and ten hundred and fifty-four (including ninety-eight women) the degree of Doctor of Medicine, as appears from the following table,—the whole number of individuals graduated being twenty-nine hundred and eighty-five.

	A. B.	Ph. D.		A. B.	A. M.	Ph. D.	M. D.
1877-78	0	4	1895-96	37	36	..	..
1878-79	3	6	1896-97	36	42	..	15
1879-80	16	5	1897-98	49	36	..	22
1880-81	12	9	1898-99	38	42	..	33
1881-82	15	9	1899-1900	46	35	..	43
1882-83	10	6	1900-01	41	30	..	53
1883-84	23	15	1901-02	49	17	..	57
1884-85	9	13	1902-03	46	27	..	49
1885-86	31	17	1903-04	37	31	..	45
1886-87	24	20	1904-05	33	35	..	54
1887-88	34	27	1905-06	48	32	..	55
1888-89	36	20	1906-07	47	35	..	76
1889-90	37	33	1907-08	47	28	..	63
1890-91	51	23	1908-09	37	27	..	53
1891-92	41	27	1909-10	14	3	25	69
1892-93	40	25	1910-11	31	11	28	85
1893-94	41	34	1911-12	37	5	32	85
1894-95	37	47	1912-13	35	11	32	76
			1913-14	52	13	30	91
			1220	47	958	1054	

Certificates of proficiency in applied electricity were awarded to ninety-one persons from 1889 to 1899.

THOMAS R. BALL,
Registrar.

REPORT OF THE LIBRARIAN

TO THE ADMINISTRATIVE COMMITTEE OF THE FACULTY:

I submit herewith my sixth annual report as Librarian, covering the fiscal year ending June 30, 1914.

LIBRARY COMMITTEES

In the lack of an ex-officio chairman of the academic committee, Professor B. L. Gildersleeve has served thru the year. Professors E. C. Armstrong, E. B. Mathews, W. W. Willoughby, and the Librarian (Secretary) are the other members. It has met monthly.

The Medical School Library Committee, consisting of Professors W. H. Howell (Chairman), J. J. Abel, L. F. Barker, W. Jones, F. P. Mall, G. H. Whipple, J. W. Williams, and the Librarian of the University, has met at irregular intervals.

STAFF

Dr. R. V. D. Magoffin, retiring from the custodianship of the Library of History, Political Economy and Political Science, was succeeded at the opening of the academic year by Miss Ellen Rothe, who gives her full time to this duty. The staff remained otherwise unchanged.

ACCESSIONS

Irrespective of binding, we received of books and pamphlets by purchase 5577 volumes in 5323; by gift 4070 volumes in 4055; by exchange 9622 volumes in 9621; by U. S. Government deposit 263 volumes; by Maryland Geological Survey deposit 65 volumes in 66; J. H. U. manuscript dissertations 41; two copies each of 31 J. H. U. printed dissertations. Total 19638 volumes in 19369 pieces. In addition we received 166 maps (47 by purchase, 43 by gift, 76 by exchange), 4 manuscripts (3 by gift, 1 by purchase), 50 charts, 1 facsimile and 617 odd numbers of periodicals.

Of these receipts 7920 were bound, but, as 19 volumes were for various reasons withdrawn, the net bound accessions were 7901. The present accession number of bound volumes in the library is, therefore, 182,678.

PURCHASES

I have previously reported that certain contributions to the Endowment and Extension Fund of 1910 were restricted by the donors to the acquisition of books in certain fields. Such are the A. Marshall Elliott Fund in French Literature and the John Stratton Gilman Fund in English Literature and Philology. A third, upon which we made the first purchases this year, is the Basil Lanneau Gildersleeve Fund in the Classics. This fund, amounting to about \$6500, was raised by the former students of Professor Gildersleeve. The income will be used in additions to the Classical Library.

Our chief purchases during 1913-14 have been in serials. This is due in part to the establishment of two new departmental libraries—Engineering and Pediatrics.

After the founding, with State funds, of the School of Technology, or, more exactly, the Department of Engineering, it became necessary to begin acquiring material in engineering, especially civil and mechanical. While books have been steadily bought in these fields as well as in electrical engineering, their predecessor here, the chief accessions have been in complete sets of the following journals:

American society of mechanical engineers. Transactions, 1880-1911. 33 vols.

Engineer, 1856-1913. 116 vols.

Institution of mechanical engineers. Proceedings, 1847-1912. 66 vols.

Verein deutscher ingenieure. Zeitschrift, 1857-1912. 56 vols.

In addition, a second set of the Encyclopaedia Britannica was secured for this department, a number of files already in our possession brought up to date and bound, and current subscriptions lodged for a long list of other periodicals. This library has been shelved this year in the Physical Laboratory as far as possible, but it will be moved during the present summer to the new Mechanical and Electrical Engineering building at Homewood, where a large room will have been shelved to receive it.

The Library of Pediatrics has been established in the Harriet Lane Home on the Johns Hopkins Hospital grounds. This is the first branch of the Medical School Library. Books in this subject are purchased from the William H. Welch Fund recently given to the University for establishing full-time professorships in Medicine, Pediatrics and Surgery. In each of these subjects \$500 a year is available for books. A beginning was made in pediatrics by the subscription to a number of periodicals, the purchase of a small lot of individual books and files of the following journals:

Archives de médecine des enfants. 1898-1913. 16 vols.

Biochemische zeitschrift. 1906-1914. 65 vols.

Journal of biological chemistry. 1906-1914. 16 vols.

Jahrbuch für kinderheilkunde (except Alte Folge) 1868-1913. 79 vols.

Zeitschrift für kinderheilkunde. 1911-1914. 19 vols.

Our historical source material has been enriched by the following collections:

Archiv für kulturgeschichte. 1903-1914. 14 vols.

Archiv für litteratur- und kirchengeschichte des mittelalters. 1895-1900. 7 vols.

Baltische studien. 1832-1912. 65 vols.

Mitteilungen aus dem Stadtarchiv von Köln. 1882-1914. 13 vols.

Quellen zur geschichte der Stadt Köln. 1860-1879. 6 vols.

Neues archiv für sächsische geschichte und altertumskunde. 1880-1912. 35 vols.

Quellen zur schweizergeschichte. 1877-1906. 25 vols. (completing our set).

Verein für geschichte der Stadt Nürnberg. Mittheilungen. 1879-1913. 20 hfte.

In political science, a set of Lawyers' reports annotated (123 vols.) was secured.

In literature should be recorded Sanford's British poets (50 vols.); Goethe, Schriften (Leipzig and Wien, Stahel and Goeschen. 1787-1790. 8 vols.—the first authorized edition of Goethe) and Lessing, Sämmtliche schriften (Lachmann-Muncker, 3. ed. 1886-1907. 21 vols.); subscriptions to new definitive editions of Balzac (Cornard 40 vols. 1912-), Dumas, père (Calmann-Levy 46 vols.) and Hugo (Imprimerie nationale 40 vols. 1904-); to Pali text society (67 vols. to date, 1885-); to Storia dei generi letterarii italiani (114 parts to date).

In classical archæology we may mention Gronovius, Thesaurus graecarum antiquitatum. 1697-1702, 13 vols.; Rossini, Le antichità dei contorni di Roma. 1826, and Riezler, Weissgrundige attische lekythen. 1914. 2 vols.

The list may be concluded with Corradini's edition of Forcellini, Lexicon totius Latinitatis. 1864-1887. 4 vols. and the Supplement to the British Museum Catalogue of printed books 1881-1900. 10 vols., tho the Catalogue unhappily is out of print and not yet secured.

GIFTS

Professor Cleveland Abbe still allows his meteorological exchanges to come to us as additions to the library founded by him.

H. R. H. Albert I, Prince of Monaco, has continued to send the Bulletins of his Institut océanographique (25 nos.) and his Résultats des campagnes scientifiques (3 fasc.).

For the eleventh year an anonymous friend has supplied for us the International catalogue of scientific literature, costing annually about £17.

The publications of German geological surveys have been acquired as for several years past from an annual fund of \$75.00, presented by Mr. and Mrs. Charles W. Field, continuing the gifts of Mrs. Field's father, the late George A. von Lingén.

Mr. Logan G. McPherson has placed at our disposal \$100.00 for the purchase of books on transportation.

Other gifts to be mentioned are from:

Andrews, E. A.: 94 vols. and 15 nos., mostly in zoology.

Armstrong, E. C.: 47 vols. and 2 nos., mainly in the field of French.

Barnett, G. E.: 23 vols. and 1 no., chiefly economic documents.

Bright, J. W.: 29 vols. and 49 nos., in French and English philology, for the most part.

Committee on the Distribution of Christian Science Literature in Md.: 14 vols. in Christian Science.

Edwards, C. G. and Phelps, C. E.: 304 vols. and 118 nos., in engineering.

Gildersleeve, B. L.: 88 vols. and 8 nos. of miscellaneous character.

Griffin, E. H.: 44 publications of the College entrance examination board; one other pamphlet.

- Hollander, J. H.: 25 vols. and 11 nos., chiefly Baltimore city documents.
- Holt, Henry, & Co.: 58 of their publications.
- Howland, J.: 23 vols. in pediatria, including about two-thirds of a set of the American pediatric society. Transactions.
- Jennings, H. S.: 8 vols. in biology.
- Norton, Rupert: 42 vols., mostly in French literature.
- Remsen, Ira: 81 vols., 321 pamphlets, 199 numbers of journals, and 2 maps.
- Smith, Mrs. K. F.: Baltimore, its history and its people. . . 1912. 3 vols.
- Sweden, K. *Socialstyrelsen*: 6 of its publications.
- White, Richard J.: 19 miscellaneous volumes.

ANALYSIS OF EXPENDITURES

I. Graduate and Collegiate Department

Salaries	\$12,095 24	
Books	5,921 47	
Periodicals	5,195 77	
Maps	92 06	
Binding	2,453 24	
A. L. A. cards.....	81 68	
Berlin cards.....	49 19	
Library Bureau cards (blank).....	203 00	
Card cabinets.....	129 25	
Postage, expressage and freight.....	867 91	
Miscellaneous	241 27	
		\$27,880 18

II. Medical School

Salary	\$396 00	
Books	418 32	
Periodicals	1,581 88	
Binding	405 75	
Card cabinets.....	77 75	
Postage	4 49	
		\$2,884 19

III. Recataloging

Salaries	\$5,069 90	
Library of Congress cards.....	300 00	
Multigraph	269 50	
Miscellaneous	22 60	
		\$5,662 00

CATALOGING DEPARTMENT

The cataloging department has worked in two sections, as usual since June, 1910. The permanent staff of five handles current accessions; the special staff, consisting this year of 12 persons, continued to work on accessions made prior to November, 1908. These two groups coincide only at the head, since Mr. Mattern, the Assistant Librarian, classifies for both, and Mr. Schulz, the Chief Cataloger, assigns subject headings for both. As usual too, the regular staff has been robbed to pay the special staff. That is to say, staff changes have been confined to the former as far as possible in order to secure continuity and reliability in the work of the latter, the presence of Mr. Schulz being relied on to secure balance in current accessions.

Thus, three of the four positions under him were each held by two persons in the course of the year. Further, none of these seven associates of his, except the lad at the flexotype, are members of his real staff, since both regular catalogers and their assistant have been transferred to the special staff, and one of these, Miss E. S. Thies, assumes the heavy responsibility of all main and added entry work. There have been minor changes in this staff also, but the main thread has been unbroken.

The record given in detail below shows that this department handled 23,902 titles representing 41,316 volumes and 152 maps, for which 104,174 cards were made. The following collections were recataloged: The Rowland library of spectroscopy, Astronomy, the Medical School library (except the Warrington Dispensary collection of medical classics and the Ahlfeld Teratological collection), the Classical, Germanic, Italian, Spanish, and Portuguese libraries, and Church history. The only libraries not thus far visited are the Sanskrit and Semitic. These, with most government documents, agriculture and scattering miscellanea, constitute the problem that remains.

In classification Mr. Mattern handled the same subjects so far as schedules have been published by the Library of Congress, but in Classics, Church history and certain smaller sections these are still lacking.

The following tables give the detailed record of each cataloging staff:

Cards:	Regular Staff.	Special Staff.	
Main entries.....	8067	15835	
Duplicate main entries...	6425	12335	
Added entries.....	13583	23557	
Duplicate added entries...	3177	5687	
Shelf list entries.....	2273	9501	
Accession entries.....	1296		
Source entries.....	843		
Cross references.....	1072	523	
Total cards.....	36736	67438	104174
Volumes.....	12334	28982	41316
Maps.....	152		152

Of the 104,174 cards prepared, 27,596 were Library of Congress printed cards, 3,095 were printed by the Royal Library of Berlin, 39,673 were printed on our flexotype, and the remaining 33,810 were typewritten.

The flexotype boys would appear to have turned out 39,673 cards. A more truthful statement would be that of the 43,554 cards which they did print for 10,198 titles set up the catalogers succeeded in getting 39,673 into the catalogs within the limits of this fiscal year. These two boys with help from a third about half the year had much else to do besides operate the machines. So did the catalogers, for they had to spend the equivalent of 440 hours of one person's time in the filing of 39,336 cards in the Library of Congress depository catalog, and they also kept up the filing in departmental catalogs where there is no local attendant.

Finally, it must always be borne in mind that upon this staff is laid the unusual task of duplicating its work for departmental catalogs. When you remember that our library is a federation of departmental libraries plus a reading room with each its catalog,

you can realize how heavy is the requisition made. Yet it is met with unexcelled economy and without sacrifice of thoro technique.

In the general catalog, which aims to be complete for the University, 70,493 cards were filed by the Reading Room custodians. The total is now 318,543 cards.

BINDING

Mr. Munzner's report shows that he prepared and sent to local binders 3,663 volumes, which were bound at a cost of \$3,321.35, or 90 2/3 cents per volume. The number of volumes bound is the largest (cf. 2,899 last year), and the price per volume the highest, in five years. The first is caused by the unusual amount of rebinding found necessary. When the recataloging staff goes thru a library we desire to leave it in good condition in all particulars. There was an abnormal amount of repairing required in the Classical Library particularly. The advance in the cost of binding per volume this year is due to the greater amount of quarto and folio work handled, both in the rebinding just mentioned and especially in engineering files. The price will take a marked drop next year, because of the decision to interrupt morocco sets and substitute buckram, except in the case of heavy volumes.

INTER-LIBRARY LOANS

In the operation of the inter-library loan service, we sent eighty-eight volumes to twenty-six institutions, and borrowed one hundred and forty-seven volumes from thirteen libraries.

It is a pleasure also to record the courtesy of Mr. Elkan N. Adler in lending two manuscripts from his private collection.

The work of this library was set forth in the Exposition of the Book Industries and Graphic Arts at Leipzig this year by means of a number of exhibits accompanied by descriptive text in English and German. The plans of Gilman Hall are reported to have awakened much interest.

M. L. RANNEY,
Librarian.

REPORT OF THE JOHNS HOPKINS PRESS

(ABSTRACT)

TO THE ADMINISTRATIVE COMMITTEE OF THE FACULTY:

I submit herewith the report of the Johns Hopkins Press for the past year.

The several serials have been maintained within the limits prescribed by the University as follows:

American Chemical Journal, edited by Professor Remsen, with Dr. Rouiller as assistant editor. Vol. L (560 pages, 8vo) was issued. This journal was discontinued as a separate publication on the completion of Vol. L, and beginning January, 1914, was incorporated with the *Journal of the American Chemical Society*.

American Journal of Insanity. This journal is the official organ of the American Medico-Psychological Association. Its editorial control is in the hands of a committee of the association, consisting of Henry M. Hurd, M. D., and E. N. Brush, M. D., of Baltimore; G. Alder Blumer, M. D., of Providence, R. I.; J. Montgomery Mosher, M. D., of Albany, N. Y.; and Charles K. Clarke, M. D., of Toronto, Ontario. A special number, Vol. LXIX, no. 5 (272 pages 8vo) containing addresses and papers read at the opening of the Henry Phipps Psychiatric Clinic of the Johns Hopkins Hospital in April, 1913, and the regular issues, four numbers of Vol. LXX (1008 pages 8vo) have appeared.

American Journal of Mathematics, edited by Professor Morley with the co-operation of Professors Cohen, Scott and other mathematicians. Numbers 3 and 4 (240 pages) completing Vol. XXXV (468 pages 4to) and two numbers of Vol. XXXVI (230 pages) have been issued. Vol. XXXVI contains a portrait of Professor W. Stahl.

American Journal of Philology, edited by Professor Gildersleeve. Numbers 3 and 4 (266 pages) completing Vol. XXXIV (560 pages 8vo) and two numbers (244 pages) of Vol. XXXV have appeared.

Beiträge zur Assyriologie und semitische Sprachwissenschaft, edited by Professor Haupt. Vol. IX part 2 (306 pages, 8vo.) appeared during the year.

Hesperia: Schriften zur germanischen Philologie, edited by Professor Collitz, and *Schriften zur englischen Philologie*, edited by Professor Bright. No part of either section appeared during the year.

Johns Hopkins Hospital Publications. We have continued the publication, on behalf of the Johns Hopkins Hospital, of the *Bulletin*, appearing monthly, and of the *Reports*, of irregular issue.

Of the *Bulletin* six numbers (198 pages) completing Vol. XXIV (396 pages 8vo) and six numbers (194 pages) of Vol. XXV have been issued.

Of the *Reports*, there have been issued three monographs: "The

Statistical Experience Data of the Johns Hopkins Hospital, Baltimore, Md., 1892-1911," by Frederick L. Hoffman (161 pages 4to); "The Origin and Development of the Lymphatic System" by Florence R. Sabin (94 pages 4to); "The Nuclei Tuberis Laterales and the So-called Ganglion Opticum Basale" by Edward F. Malone (70 pages and 15 plates, 4to). These monographs are issued in advance of Vol. XVII of which they will form a part.

The Johns Hopkins University Circular, including Annual Report of the President, University Register, Medical Department Catalogue, etc. T. R. Ball, editor. Four numbers (826 pages) completing Vol. XXXII (1114 pages 8vo) and six numbers, (702 pages) of the 1914 volume have been issued. These have included Confering of Degrees 1913, Mathematical Seminary Notes, Bibliography of the Oriental Seminary, Attendants on Summer Courses, 1913, issued in July; Medical Department Catalogue for 1913-14, issued in October; Preliminary Register 1913-14, issued in November; Bibliography of the Department of Geology, 1883-1913, issued in December; Report of the President, 1912-13, issued in January; Summer Courses July 6-August 13, 1914, issued in February; Three Studies in Current Philosophical Questions, issued in March; Graduates and Fellows of the Johns Hopkins University 1876-1913, issued in April; College Courses for Teachers 1914-15, issued in May; University Register 1913-14, issued in June.

The Johns Hopkins University Studies in Historical and Political Science. The Studies are issued under the direction of the departments of history, political economy and political science. Two numbers (248 pages) completing Series XXXI (600 pages 8vo) and two numbers (442 pages) of Series XXXII have been published. These have included "The Free Negro in Virginia, 1619-1865" by John H. Russell; "The Quinquennales" by Ralph Van Deman Magoffin; "Jurisdiction in American Building-Trades Unions" by Nathaniel Ruggles Whitney; "Slavery in Missouri, 1804-1865" by Harrison Anthony Trexler.

Modern Language Notes, edited by Professor E. C. Armstrong, J. W. Bright, B. J. Vos and C. C. Marden (managing editor). Two numbers (74 pages) completing Vol. XXVIII (274 pages) and six numbers (200 pages) of Vol. XXIX have been issued.

Elliott Monographs in the Romance Languages and Literatures, edited by Professor Armstrong. The publication of this series has just begun, and three numbers are in press.

Of the *Hebrew Text of the Polychrome Bible*, edited by Professor Haupt, no part appeared during the year.

Reprint of Economic Tracts, edited by Professor Hollander. One number "Money Answers All Things" by Jacob Vanderlint (164 pages 8vo) was issued during the year. This is the third number of the third series, which is devoted to the eighteenth century.

Terrestrial Magnetism and Atmospheric Electricity, edited by Dr. Bauer. Numbers 3 and 4 (112 pages) completing Vol. XVIII (216 pages 8vo) and two numbers (112 pages) of Vol. XIX were issued.

A new book by Professor Mustard on *The Piscatory Eclogues of Jacopo Sannasaro* is in press. These Latin poems are very clever imitations, or adaptations, of some of Virgil's Bucolics.

106048

Another volume of the Albert Shaw Lectures on Diplomatic History by F. A. Updyke of Dartmouth College on the *Diplomacy of the War of 1812* is in press.

A new edition of *Experiments in General Chemistry and Introduction to Chemical Analysis* by Jacob Volhard and Clemens Zimmerman, translated by Edward Renouf, was published during the year.

The New Book Department received during the past year 2988 volumes, including 530 sent on inspection. Of these 2528 were purchased by members of the University, 60 by the library and 400 returned to the publishers.

Messrs. G. E. Stechert and Company and the Macmillan Company both of New York have continued sending consignments of books regularly on inspection. We greatly appreciate the co-operation of these two firms and their services are highly valued by members of the University.

C. W. DITTUS,
Secretary.

DISSERTATIONS PUBLISHED DURING THE YEAR

Following is a list of dissertations for the degree of Doctor of Philosophy published during the year, of which the required number of one hundred and fifty copies have been received by the University:

Austin, Herbert Douglas: Accredited Citations in Ristoro D'Arrezzo's *Composizioni del Mondo*: A Study of Sources.

Bacon, Clara Latimer: The Cartesian Oval and the Elliptic Functions ρ and σ .

Basset, Gardner Cheney: Habit Formation in a Strain of Albino Rats of Less than Normal Brain Weight.

Blum, Solomon: Jurisdictional Disputes Resulting from Structural Differences in American Trade Unions.

Cash, Gentry: A Study of the Osmotic Pressure of Cane Sugar Solutions at 30°, 35° and 40°.

Duncan, Thomas Shearer: The Influence of Art on Description in the Poetry of P. Papinius Statius.

Fenwick, Charles G.: The Neutrality Laws of the United States.

Fisher, G. Clyde: Seed Development in the Genus *Peperomia*.

Fitch, Theodore T.: The Influence of Density of Gas on the Formation of Corona.

Hawkins, Lon A.: The Influence of Calcium, Magnesium and Potassium Nitrates upon the Toxicity of Certain Heavy Metals toward Fungus Spores.

Hewlett, Clarence Wilson: Analysis of Complex Sound Waves.

Howell, Janet Tucker: The Fundamental Law of the Grating.

Hughes, Horatio: Conductivity and Viscosity of Solutions of Rubidium Salts in Mixtures of Acetone and Water.

Johnson, Harry Miles: Audition and Habit Formation in the Dog.

Lund, Elmer J.: The Relations of Bursaria to Food. I. Selection in Feeding and in Extrusion.

Maneval, Willis Edgar: The Development of Magnolia and Liriodendron, including a Discussion of the Primitiveness of the Magnoliaceae.

Maynard, Thomas Poole: The Fauna of the Keyser Member of the Helderberg Formation in Maryland.

Nicholson, Patrick Joseph: Some Experiments on the Physical Properties of Selenium with a Theoretical Discussion based on the Electron Theory.

Ohern, Daniel Webster: A Contribution to the Lower Devonian Faunas of Maryland.

Rhyne, O. P.: A Special Class of Mixed Preterites in Middle High and Modern German.

Rowe, Richard Burton: A Study of the Paleodevonian Formations of Maryland.

Russell, John Henderson: The Free Negro in Virginia, 1619-1865.

Schneeberger, Philip: The Fractionation of California Petroleum by Diffusion through Fuller's Earth.

Schick, George V.: The Stems *Dōm* and *Dāmām* in Hebrew.

Smith, Leslie Denis: Conductivity, Temperature Coefficients of Conductivity, Dissociation and Constants of Certain Organic Acids, between Zero and Sixty-five Degrees.

Tracey, Joshua Irving: Covariant Curves of the Plane Rational Quintic.

Trexler, Harrison Anthony: Slavery in Missouri, 1804-1865.

Wells, George Ross: The Influence of Stimulus-Duration on Reaction Time.

Whitney, Nathaniel Ruggles: Jurisdiction in American Building-Trades Unions.

Winger, Roy Martin: Self-Projective Rational Curves of the Fourth and Fifth Orders.

York, Harlan Harvey: The Origin and Development of the Embryo Sac and Embryo of *Dendrophthora opuntioides* (L) Eich. and *D. gracile* Eich.

C. W. DITTUS,
Secretary, The Johns Hopkins Press.

REPORT ON THE OFFICIAL STATE BUREAUS CONNECTED WITH THE UNIVERSITY

TO THE ADMINISTRATIVE COMMITTEE OF THE FACULTY:

I submit herewith a report of the official State Bureaus conducted in co-operation with the geological department.

THE MARYLAND GEOLOGICAL SURVEY

The Maryland Geological Survey has now been in existence for eighteen years, having been established by an Act of the General Assembly in March, 1896. It has been in charge of Professor Clark as State Geologist since its establishment. The appropriations during the first two years amounted to \$10,000 annually. In 1898 a second Act was passed providing \$5,000 additional to be used chiefly in the preparation of a base map of the State. Both of these Acts are still in operation, the total appropriation of the Survey, therefore, being at the present time \$15,000 annually. The Survey devotes its activities chiefly to geological studies and to the preparation of topographic maps of the State, although consideration is also given independently or in co-operation with other bureaus, both Federal and State, to the study of problems connected with terrestrial magnetism, forestry, hydrography, and agricultural soils of the State.

The Survey maintained for twelve years, from 1898 to 1910, a Highway Division. During the earlier years of this period the work was largely advisory. A testing laboratory was established and plans and specifications for road and street improvement by the state, county, and municipal authorities were prepared. In 1904 an Act was passed providing for the construction of State Aid roads, \$200,000 annually being appropriated by the State to be met by an equal amount from the counties, the work to be done under the plans, specifications, and supervision of the State Geological Survey. In 1906, 1908, and 1910 \$384,000 in all were appropriated for the construction of a modern highway from Baltimore to Washington under the auspices of the Geological Survey. Altogether over \$1,500,000 were appropriated by the State and counties to be spent under the auspices of the Survey, and over 150 miles of modern roadway were constructed. During this period the various deposits available for road construction throughout the State were tested, as well as the various materials employed on the streets of most of the cities and towns of the State. Much advice in the matter of road and street construction was given to the public officials. In 1910 the highway work of the Survey was transferred to the newly-organized State Roads Commission, of which President Remsen and Professor Clark were made members. They continued in this capacity until 1914.

The geological work, which is directly under the charge of the State Geologist and the Assistant State Geologist, Professor Ma-

thews, is divided into three divisions, covering the areas of the Piedmont Plateau, the Appalachian Region, and the Coastal Plain. Investigations are in progress in all these districts and extensive areas in each have already been studied. Reports have already been issued for Allegany, Garrett, Cecil, Calvert, St. Mary's, and Prince George's counties, while the investigations have been completed for Harford, Anne Arundel, Kent, Queen Anne's, Talbot, Caroline, and Washington counties. Work is now in progress in Baltimore, Carroll, and Howard counties. In the conduct of the geological work the aid of numerous experts in various parts of the country has been sought, particularly in the study of the several groups of fossil plant and animal remains. Monographs on the Devonian, Lower Cretaceous, Eocene, Miocene, Pliocene and Pleistocene deposits of the State have already been published and similar reports on the Ordovician, Silurian, Carboniferous, and Upper Cretaceous are now in preparation. Special economic reports on building stones, clays, coals, limestones, and iron ores have been issued.

The topographic work has been continued in co-operation with the United States Geological Survey. The results of this work are presented to the public on the scale of one mile to one inch either in the form of 15' sheets or in the form of topographic and election district county maps. They show in a very detailed manner not only the relief of the land but cultural features as well. Maps of all the counties have already been published. A map of Baltimore and vicinity on the scale of 1000 feet to the inch is also in progress of publication. Three sheets have already been issued each covering 20 square miles. A map on the same scale has also been published for Hagerstown and vicinity and a similar map is in preparation for Cumberland and vicinity.

The investigations in terrestrial magnetism, hydrography, agricultural soils, and forestry have been proceeding as hitherto in co-operation with State and National bureaus. The forestry work is now for the most part in charge of the later-organized State Board of Forestry, but the Geological Survey will continue to publish county reports and maps on this subject.

THE MARYLAND WEATHER SERVICE

The Maryland Weather Service has been in existence for over twenty years, having been organized in May, 1891, under the joint auspices of the Johns Hopkins University, the Maryland Agricultural College, and the United States Weather Bureau. It was established as an official organization by the General Assembly of 1892, the Act being approved by the Governor in April of that year. The State Weather Service under this Act was permanently placed at the Johns Hopkins University under the direction of a Board of Control nominated by the heads of the three institutions above mentioned who were subsequently commissioned by the Governor. The appropriation for the maintenance of the bureau has been \$2,000 annually since its establishment, the fund being employed mainly for investigations relating to the climatology of the State. Professor Clark has been the chief of the bureau since its organization.

The Weather Service has published, in addition to many small

reports and bulletins, three large final volumes, the first dealing with the physiography and meteorology of the State at large, the second with the climate and weather of Baltimore and vicinity, and the third with the distribution of plant life particularly in its relations to climate and soils.

The Weather Service has taken up under the direction of Professor Livingston of the Johns Hopkins University a quantitative study of the results of climatic factors upon vegetation. By growing various cultivated plants at different stations throughout the State under similar soil conditions and keeping a careful quantitative record of their growth, changes and physiological activity, it is expected that accurate data will be obtained showing the result of the varying climatic conditions on crop production.

THE MARYLAND FORESTRY BUREAU

An Act was passed by the General Assembly of 1906 providing for a State Board of Forestry to consist of seven members, four of whom are *ex officio* the same as the commissioners of the Geological Survey, the fifth is the State Geologist, while the sixth and seventh are appointed by the Governor. Professor Clark is the executive officer of the Board and has been authorized by the Board to see that the provisions of the Act are carried out. Mr. F. W. Besley is the State Forester. Under this Act \$3,500 was appropriated for the first two years and \$4,000 annually for the succeeding four years, while an additional \$1,000 was appropriated by the General Assembly of 1910 to meet the expenses of publication of forestry maps. The Legislature of 1912 greatly increased the resources and powers of the State Board of Forestry, appropriating \$10,000 annually for the general expenses of the Board, besides \$50,000 for the purchase of lands in the valley of the Patapsco River in Baltimore and Howard counties for a State Reservation, and \$8,500 for the purchase of old Fort Frederick and the surrounding lands in Washington County. In addition to the above appropriations the sum of \$6,000 was appropriated for the publication of maps and reports, thus rendering available for the two years, 1912-1913 and 1913-1914, the total sum of \$84,500. The Legislature of 1914 passed laws at the suggestion of the Board, providing for the preservation of road-side trees and the planting of shade trees along the highways. At the same time it prohibited the placing of unauthorized signs along the public roads. The administration of these laws is in the hands of the Board.

The State Forester and his assistants have prepared plans for more economical forest management of the woodlands of the State and have on solicitation given advice to a large number of owners of wood lots throughout the State. One of the chief aims of the Forestry Board has been the education of the people of the State in matters pertaining to forest management in order that the growing timber of the State may be utilized to the greatest advantage.

COÖPERATION

Much aid has been rendered the several State bureaus above mentioned by the chiefs of the various Federal bureaus. Particular

reference should be made to the coöperation granted by the Director of the United States Geological Survey, the Chief of the United States Coast and Geodetic Survey, the Chief of the United States Weather Bureau, the Chief of the United States Forest Service, and the Chief of the United States Bureau of Soils, all of whom have cordially supplemented the work of the State organizations in many ways. The work of the State organizations is in progress along so many lines that it affords admirable opportunities for the students of the University to obtain much desired practical experience both in the field and in the laboratory, while at the same time the State receives a large return for its outlay.

WM. BULLOCK CLARK.

REPORT OF THE DIRECTOR OF THE BUREAU OF APPOINTMENTS

TO THE ADMINISTRATIVE COMMITTEE OF THE FACULTY:

I have the honor to present herewith a report of the activities of the Bureau of Appointments of this University from June, 1913, to October, 1914.

During the sixteen months that have elapsed since the establishment of the Bureau, the number of letters written to persons outside of the University was three hundred and fifty-nine, to persons in the University, one hundred and one. The number of circulars sent out was ninety-seven, number of postal cards seven hundred, telegrams fifteen. The Bureau has had applications for one hundred and twenty teachers, one principal, twenty-five tutors, two men to fill professional positions, and two to fill business positions. It has recommended for these positions fifty-six teachers, fifteen of whom have been appointed. It has recommended nineteen tutors, all of whom have secured the positions. It has recommended one principal, but no appointment was made. It has filled one business position. It has also been the means of getting a research position for one person.

The file of the Bureau has in it the applications for positions of nine of the University undergraduates, thirty-five of its graduate students who are now or were at the time of application still in the University, and thirty-two graduates who are no longer in the University and who are applying for other or better positions.

The director has received during the year numbers of letters from alumni commending the plan of the work which the Bureau of Appointments has undertaken and the results which it has accomplished. These results indicate that the Bureau has well justified its inception, and it is believed that it will each year become of greater importance, and will help in its way to further the good feeling between the University and its graduates.

To this report is appended a copy of the annual expense account of the Bureau and a tabular list, for comparative and informative reasons, of the applications and appointments according to subjects.

RALPH V. D. MAGOFFIN,
Director.

DEGREES CONFERRED 1913-14

DOCTOR OF PHILOSOPHY

John H. Ashworth, of Bland, Va., A. B., Emory and Henry College, 1906. *Subjects*: Political Economy, Political Science, and History. *Dissertation*: The Helper and American Trade Unions. *Referees on Dissertation*: Professors Hollander and Barnett.

Frederick Augustus Blossom, of Baltimore, A. B., Amherst College, 1898. *Subjects*: French, Spanish, and Italian. *Dissertation*: La Composition de *Salammbô* d'après la Correspondance de Flaubert (1857-1862), avec essai de classement chronologique des lettres. *Referees on Dissertation*: Professors Armstrong and Morize.

Ella Bourne, of Chattanooga, Tenn., Ph. B., De Pauw University, 1893; Ph. M., University of Michigan, 1897. *Subjects*: Classical Archaeology, Latin, and History. *Dissertation*: A Study of Tibur—Historical, Literary, and Epigraphical—from the Earliest Times to the Close of the Roman Empire. *Referees on Dissertation*: Professor Robinson and Dr. Magoffin.

Floyd Barzilia Clark, of Chester, Va., A. B., Richmond College, 1907. *Subjects*: Political Science, Political Economy, and History. *Dissertation*: The Constitutional Doctrines of Justice Harlan, as Stated Mainly in His Dissenting Opinions. *Referees on Dissertation*: Professors Willoughby and Latané.

Walter Fieldhouse Clarke, of Danville, Va., A. B., Hampden-Sidney College, 1913. *Subjects*: Chemistry, Physical Chemistry, and Physics. *Dissertation*: A Study of the Hydrogen Electrode and of the Calomel Electrode. *Referees on Dissertation*: Professors Acree and Ames.

William Lee Dolley, Jr., of Fredericksburg, Va., A. B., Randolph-Macon College, 1907. *Subjects*: Zoology, Botany, and Physics. *Dissertation*: Reactions to Light in *Vanessa Antiopa*, with Special Reference to Circus Movements. *Referees on Dissertation*: Professors Jennings and Mast.

John Levi Donaldson, of Berwyn, Md., S. B., Maryland Agricultural College, 1910. *Subjects*: Political Science, Political Economy, and History. *Dissertation*: State Administration in Maryland. *Referees on Dissertation*: Professors Willoughby and Latané.

John Bowen Edwards, of Westminster, Md., A. B., Western Maryland College, 1903. *Subjects*: Greek, Latin, and Sanskrit. *Dissertation*: The Demesman in Attic Life. *Referees on Dissertation*: Professors Robinson and Gildersleeve.

Daniel Stanley Elliott, of Baltimore, A. B., Johns Hopkins University, 1911, and A. M., 1913. *Subjects*: Physics, Astronomy, and Mathematics. *Dissertation*: A Comparative Study of the Light

Sensibility of Selenium and Stibnite at 20° and -190° C. *Referees on Dissertation*: Professors Ames and Pfund.

Edwin Louis Frederick, of Catonsville, Md., A. B., Johns Hopkins University, 1911. *Subjects*: Chemistry, Physical Chemistry, and Geology. *Dissertation*: The Osmotic Pressure of Mannite Solutions between 10° and 40° . *Referees on Dissertation*: Professors Morse and H. C. Jones.

Josiah Wesley Gain, of Rip Raps, Va., S. B., University of Chicago, 1910. *Subjects*: Mathematics, Education, and Astronomy. *Dissertation*: Linear Combinants of Ternary Forms. *Referees on Dissertation*: Professors Morley and Coble.

William Stuart Gorton, of Baltimore, Md., A. B., Johns Hopkins University, 1908, and A. M., 1910. *Subjects*: Physics, Applied Electricity, and Mathematics. *Dissertation*: The Effect of Frequency upon the Corona. *Referees on Dissertation*: Professors Whitehead and Ames.

Harry Clinton Gossard, of Gibsonburg, O., S. B., Ohio Northern University, 1908. *Subjects*: Mathematics, Astronomy, and Educational Psychology. *Dissertation*: On a Special Elliptic Ruled Surface of the Ninth Order. *Referees on Dissertation*: Professors Morley and Cohen.

Arthur Hamilton, of Fort Wayne, Ind., A. B., Harvard University, 1907; A. M., University of Michigan, 1910. *Subjects*: French, Spanish, and Italian. *Dissertation*: Sources of the Religious Element in Flaubert's *Salammbô*. *Referees on Dissertation*: Professors Morize and Armstrong.

Enoch Karrer, of Seattle, Wash., A. B., University of Washington, 1911. *Subjects*: Physics, Mathematics, and Applied Electricity. *Dissertation*: A Method of Determining the Radiant Luminous Efficiency of a Light Source by Means of a Cell whose Transmission Curve is Identical with the Luminosity Curve of the Average Eye. *Referees on Dissertation*: Professors Ames and Pfund.

Shinjiro Kitasawa, of Tokyo, Japan, A. B., Waseda University, 1910; A. M., University of North Carolina, 1911. *Subjects*: Political Economy, Political Science, and History. *Dissertation*: A Study of the National Debt of Japan. *Referees on Dissertation*: Professors Hollander and Barnett.

Karl Spencer Lashley, of Davis, W. Va., A. B., West Virginia University, 1910; M. S., University of Pittsburgh, 1911. *Subjects*: Zoology, Psychology, and Psycho-Pathology. *Dissertation*: Inheritance in the Asexual Reproduction of Hydra. *Referees on Dissertation*: Professors Jennings and Andrews.

James Miller Leake, of Ashland, Va., A. B., Randolph-Macon College, 1902. *Subjects*: History, Political Science, and Political Economy. *Dissertation*: The Virginia Committee System and the Revolution. *Referees on Dissertation*: Professors Latané and Vincent.

Herbert August Lubs, of Savannah, Ga., A. B., Newberry College, 1910. *Subjects*: Chemistry, Physical Chemistry, and Applied Elec.

Dissertation: 1. The Action of Potassium Permanganate Upon 1-Phenyl-3-Thiourazole and 1-Phenyl-3-Thiomethylurazole. 2. The Tautomerism of 1-Phenyl-5-Oxy-4, 5-Dihydro-3-Triazolyl Methyl Sulphone. 3. The Tautomerism of the Amides. *Referees on Dissertation:* Professors Acree and Abel.

Elmer J. Lund, of Olivia, Minn., Ph. B., Hamline University, 1910. *Subjects:* Zoology, Botany, and Physical Chemistry. *Dissertation:* The Relation of Bursaria to Food: I. Selection in Feeding and in Extrusion. *Referees on Dissertation:* Professors Jennings and Mast.

Donald MacKenzie, of Baltimore, A. B., Johns Hopkins University, 1908, and A. M., 1911. *Subjects:* Physics, Applied Electricity and Astronomy. *Dissertation:* The Corona in Air at Continuous Potentials and Pressures Lower than Atmospheric. *Referees on Dissertation:* Professors Whitehead and Ames.

Bessie Irving Miller, of Govans, Md., A. B., Goucher College, 1907. *Subjects:* Mathematics, Astronomy, and Classical Archaeology. *Dissertation:* A New Canonical Form of the Elliptic Integral. *Referees on Dissertation:* Professors Morley and Coble.

Annabella Elliott Richards, of Merion Station, Pa., A. B., Bryn Mawr College, 1907. *Subjects:* Physiological Chemistry, Physical Chemistry, and Organic Chemistry. *Dissertation:* The Partial Enzymotic Hydrolysis of Yeast Nucleic Acid. *Referees on Dissertation:* Professors Walter Jones and Howell.

Henry Christian Schmeisser, of Baltimore, A. B., Johns Hopkins University, 1908, and M. D., 1912. *Subjects:* Pathology, Bacteriology, and Physiology. *Dissertation:* Leukaemia of the Fowl: Spontaneous and Experimental. *Referees on Dissertation:* Professors Welch and Mall.

Walter Francis Shenton, of Pottstown, Pa., S. B., Dickinson College, 1907. *Subjects:* Mathematics, Physics, and Astronomy. *Dissertation:* Linear Combinants of Systems of Binary Forms with the Syzygies of the Second Degree Connecting Them. *Referees on Dissertation:* Professors Morley and Coble.

Edward Hinman Sirich, of Baltimore, A. B., Johns Hopkins University, 1906. *Subjects:* French, Spanish, and Italian. *Dissertation:* A Study in the Syntax of Alexander Hardy. *Referees on Dissertation:* Professors Armstrong and Morize.

William Anthony Taylor, of Jarrettsville, Md., A. B., Randolph-Macon College, 1908. *Subjects:* Chemistry, Physical Chemistry, and Applied Electricity. *Dissertation:* 1. On the Reactions of both the Ions and Molecules of Acids, Bases, and Salts. On the Reaction of Sodium Ethylate and Methyl Iodide in Absolute Ethyl Alcohol at 0°. 2. A Re-interpretation of the Work of Hecht, Conrad, and Bruckner on the Reaction of Alkyl Halides with Sodium Ethylate at Different Temperatures. 3. On the Configurations of α and β Glucose and the Equilibrium between Mucic Acid and its Lactones. *Referees on Dissertation:* Professors Acree and Abel.

Harrison Anthony Trexler, of Omaha, Neb., Ph. B., Bellevue College, 1906. *Subjects*: History, Political Science, and Political Economy. *Dissertation*: Slavery in Missouri, 1804-1865. *Referees on Dissertation*: Professors Latané and Vincent.

Leo Wolman, of Baltimore, A. B., Johns Hopkins University, 1913. *Subjects*: Political Economy, Mathematics, and Political Science. *Dissertation*: The Boycott in American Trade Unions. *Referees on Dissertation*: Professors Hollander and Barnett.

Mabel Minerva Young, of Wellesley, Mass., A. B., Wellesley College, 1898; A. M., Columbia University, 1899. *Subjects*: Mathematics, Physics, and Education. *Dissertation*: Dupin's Cyclide as a Self-Dual Surface. *Referees on Dissertation*: Professors Morley and Cohen.

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DOCTOR OF MEDICINE

Grover A. Batten, of Lost Creek, W. Va., A. B., Washington and Lee University, 1908.

Stanhope Bayne-Jones, of New Orleans, La., A. B., Yale University, 1910.

Mabel Belt, of Baltimore, A. B., Goucher College, 1910.

Ralph Boerne Bettman, of Chicago, Ill., A. B., Williams College, 1911.

Julius Benjamin Boehm, of St. Louis, Mo., S. B., St. Louis University, 1910.

Kate Breckenridge Bogle, of Danville, Ky., A. B., Goucher College, 1909.

Ernest Speers du Bray, of Cincinnati, O., A. B., University of Cincinnati, 1910.

Nathaniel Hawley Brush, of Towson, Md., A. B., Johns Hopkins University, 1909.

Francis Patrick Carroll, of Hartford, Conn., S. B., Trinity College (Conn.), 1911.

David Wendel Carter, Jr., of Georgetown, Tex., A. B., Southwestern University, 1909.

Dorothy Child, of Philadelphia, Pa., A. B., Bryn Mawr College, 1910.

Mildred Clark, of Brookline, Mass., A. B., Wellesley College, 1910.

Howard Spencer Colwell, of Auburn, N. Y., S. B., Colgate University, 1910.

Charles Edward Connor, of Terre Haute, Ind., A. B., Indiana University, 1910.

Robert Hope Crawford, of Rock Hill, S. C., S. B., Davidson College, 1910.

Isaac Davis, of Pittsburgh, Pa., A. B., Harvard University, 1910.

Ralph Moore Dodson, of Baker City, Ore., A. B., University of Oregon, 1910.

John Calvert Donaldson, of Philadelphia, Pa., Ph. B., Yale University, 1910.

Harry Bright Dornblaser, of Springfield, O., A. B., Wittenberg College, 1907.

Chester Arthur Downs, of Portland, Ore., A. B., University of Oregon, 1910.

Edmond Frederic Ducasse, of Baltimore, A. B., University of Washington, 1910.

William Core Duffy, of Kinston, N. C., A. B., Wake Forest College, 1910.

John Baxter Duncan, of Macon, Ga., A. B., Mercer University, 1910.

George R. Dunn, of Princeton, Minn., Ph. B., Hamline University, 1910.

Avis Chippewa Eaton, of Princeton, Minn., A. B., Wellesley College, 1909.

Marion W. Emrick, of Shamokin, Pa., Ph. B., Franklin and Marshall College, 1910.

Thomas Shepherd Englar, of Medford, Md., A. B., Western Maryland College, 1910.

Frank Alexander Evans, of Wilkinsburg, Pa., A. B., Washington and Jefferson College, 1910.

Walter A. Fansler, of Sedalia, Mo., A. B., University of Missouri, 1911.

Allen Garthwright Fechtig, of Wilmington, N. C., A. B., University of the South, 1910.

James Grant Fergusson, of Forfarshire, Scotland, A. B., Leland Stanford Jr. University, 1908.

LeRoy Newton Fleming, of Oxford, O., A. B., Miami University, 1910.

Morris Flexner, of Louisville, Ky., A. B., University of Michigan, 1910.

Mary Louise Frazee, of Pittsburgh, Pa., A. B., Goucher College, 1908.

Harold Bearce Gardner, of New Hampton, Ia., S. B., Grinnell College, 1910.

Floyd Grave, of Monrovia, Ind., S. B., Carleton College, 1908.

Hugh Johnson Hagan, of Roanoke, Va., A. B., Washington and Lee University, 1910.

Raymond Fisher Hain, of Bernville, Pa., S. B., Bucknell University, 1910.

Raymond Confer Hall, of Mill Hall, Pa., S. B., Wesleyan University (Conn.), 1909.

Henry Hunton Hampton, of Hill City, Tenn., S. B., University of Tennessee, 1903.

Bryant Eugene Harrell, of Norfolk, Va., A. B., Randolph-Macon College, 1907.

Walter Clark Haupt, of Baltimore County, Md., Ph. D., Johns Hopkins University, 1908.

Mary Ashmun Hodge, of San Diego, Cal., A. B., Leland Stanford Jr. University, 1908.

- Charles Warren Hooper, of Great Bend, Kansas, A. B., University of Kansas, 1911.
- Lyman Foster Huffman, of Gallion, O., S. B., Ohio Wesleyan University, 1910.
- James Elder Hutchison, of Xenia, O., A. B., Ohio State University, 1909.
- Ruth Ingraham, of Brooklyn, N. Y., A. B., Vassar College, 1907.
- William David Jack, of Peru, Neb., A. B., Creighton University, 1908.
- Walter Falke Jones, of Utica, N. Y., A. B., Hamilton College, 1908.
- William Shirey Keister, of Roanoke, Va., A. B., Roanoke College, 1907.
- Claude Currie Kelly, of Valdosta, Ga., S. B., Davidson College, 1909.
- Clarence Searle Ketcham, of Newburgh, N. Y., B. L., Rutgers College, 1910.
- John Theodore King, Jr., of Baltimore, A. B., Princeton University, 1910.
- Leigh Seward Krake, of West Point, Neb., A. B., University of Nebraska, 1907.
- Floyd August Martin, of El Dorado Springs, Mo., A. B., University of Missouri, 1911.
- Norman Clyde Marvel, of Baltimore, A. B., Johns Hopkins University, 1910.
- Caroline McGill, of Lebanon, Mo., A. B., University of Missouri, 1904, and Ph. D., 1908.
- Jerome Meyer, of Uniontown, Ala., S. B., University of Alabama, 1908.
- Roscoe E. Mosiman, of Aberdeen, S. D., S. B., Huron College, 1910.
- Robert Davies Moyle, of Toronto, Canada, A. B., McMaster University, 1908.
- John Kelso Ormond, of Princeton, N. J., A. B., Princeton University, 1906.
- John Shaffer Plumer, of Emsworth, Pa., S. B., University of Pittsburgh, 1909.
- Leslie Hall Redelings, of Marinette, Wis., S. B., Northwestern University, 1909.
- John Davis Reichard, of Fairplay, Md., A. B., Trinity College (Conn.), 1910.
- Ferdinand Oscar Wolfgang Reinhard, of Baltimore, A. B., Johns Hopkins University, 1908.
- Aaron Robinson, of Baltimore, A. B., Johns Hopkins University, 1910.
- Ethel May Rockwood, of Townsend, Mass., S. B., Simmons College, 1909.
- Alma Sophia Rothholz, of Baltimore, A. B., Smith College, 1910.
- Harry C. Saltzstein, of Milwaukee, Wis., Ph. B., Yale University, 1910.

John Joseph Szymanski Schmidt, of Brooklyn, N. Y., A. B., St. John's College (Brooklyn), 1910.

John Holt Sewell, of Jacksboro, Tex., E. E., University of Texas, 1908.

Floyd Elmer Shaffer, of Lebanon, Pa., A. B., Lebanon Valley College, 1910.

Joseph Leslie Sherrick, of Monmouth, Ill., A. B., Monmouth College, 1908; A. M., Yale University, 1910.

Leroy Briggs Sherry, of Pasadena, Cal., A. B., University of Illinois, 1910.

Richard Lee Silvester, of College Park, Md., S. B., Maryland Agricultural College, 1909.

Landon Elwood Stubbs, of Belroi, Va., A. B., Randolph-Macon College, 1910.

Herbert Douglas Taylor, of Baltimore, A. B., St. John's College, 1910.

Otto E. Utzinger, of Astoria, Ore., A. B., Leland Stanford Jr. University, 1910.

Joseph Stephens Vanneman, of Havre de Grace, Md., Ph. B., Dickinson College, 1910.

Laurie Van Valsah, of Springfield, Ore., A. B., University of Oregon, 1910.

John Manning Venable, of Chapel Hill, N. C., A. B., University of North Carolina, 1910.

Samuel Shelton Watkins, of Owensboro, Ky., A. B., Centre College, 1908.

Joseph Webb, of Springfield, O., A. B., Wittenberg College, 1910.

Roscoe Clayton Webb, of Tracy, Minn., A. B., University of Minnesota, 1911.

Jerome Pierce Webster, of Plymouth, N. H., A. B., Trinity College (Conn.), 1910.

Harry Eugene Wilson, of Tilghmana, Md., A. B., St. John's College, 1910.

Sylvain Beer Wolff, of Washington, La., S. B., Louisiana State University, 1910.

Evans Beauchamp Wood, of Troy, Ala., S. B., Alabama Polytechnic Institute, 1907.

Alan Churchill Woods, of Baltimore, A. B., Johns Hopkins University, 1910.

Herbert Maxwell Nash Wynne, of Bethany, W. Va., S. B., Bethany College, 1906.

Isadore Zadek, of Montgomery, Ala., S. B., Alabama Polytechnic Institute, 1910.

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MASTER OF ARTS

Lewin Wethered Barroll, of Baltimore, A. B., Washington College, 1908, and Yale University, 1910; LL. B., University of Maryland, 1912. *Subject*: Political Science. *Essay*: The Constitutional Aspect of State Liquor Legislation. *Referees on Essay*: Professors Willoughby and Latané.

Lucy Gwyn Branham, of Baltimore, A. B., Washington College, 1911. *Subject: History. Essay: An Outline of the Political History of Georgia During the Revolutionary War. Referees on Essay: Professors Latané and Vincent.*

Leslie Hepburn Buckler, of Baltimore, A. B., Johns Hopkins University, 1912. *Subject: Political Science. Essay: Regulation of Competition by Law: A Study of the Purpose and Application of the Antitrust Act of 1890. Referees on Essay: Professors Willoughby and Barnett.*

Clinton Coppage Caldwell, of New Castle, Va., A. B., Roanoke College, 1905. *Subject: Political Economy. Essay: The Licensing of Workmen and American Trade Unions. Referees on Essay: Professors Hollander and Barnett.*

Grace Adelaide Dunn, of Princeton, Minn., Ph. B., Hamline University, 1909. *Subject: Botany. Essay: A Study of the Development of Halosaccion Ramentaceum. Referees on Essay: Professor D. S. Johnson and Professor I. F. Lewis, of the University of Wisconsin.*

Early Lee Fox, of Front Royal, Va., A. B., Randolph-Macon College, 1909. *Subject: History. Essay: Foreign Consuls in the Confederate States. Referees on Essay: Professors Latané and Vincent.*

Arthur Feddeman Gorton, of Baltimore, A. B., Johns Hopkins University, 1912. *Subject: Physics. Essay: The Quantum Theory of Radiation. Referees on Essay: Professors Ames and Anderson.*

Louis Knott Koontz, of Frederick, Md., A. B., Washington and Lee University, 1908. *Subject: History. Essay: The Virginia Frontier during the French and Indian Wars. Referees on Essay: Professors Latané and Vincent.*

Marie Loretto Lilly, of Baltimore, A. B., Notre Dame College (Md.), 1900. *Subject: English. Essay: The Georgic in English Literature. Referees on Essay: Professors Bright and Mustard.*

Edward Duffield Martin, of Baltimore, A. B., Johns Hopkins University, 1911; LL. B., University of Maryland, 1913. *Subject: Political Science. Essay: The Full Faith and Credit Clause of the United States Constitution. Referees on Essay: Professors Willoughby and Latané.*

Youel Benjamin Mirza, of Urumia, Persia. *Subject: Political Science. Essay: Persian Jurisprudence. Referees on Essay: Professors Willoughby and Vincent.*

Charles Frederick Ranft, of Baltimore, A. B., Johns Hopkins University, 1902. *Subject: History. Essay: History of the Post Office in the American Colonies, 1710-1789. Referees on Essay: Professors Latané and Vincent.*

Henry Francis Sturdy, of Annapolis, Md., A. B., St. John's College, 1906. *Subject: History. Essay: Colonial Administration of Justice in Maryland under Governor Leonard Calvert, March 25, 1634-June 9, 1647: A Study in Early Colonial Judicial Procedure. Referees on Essay: Professors Latané and Willoughby.*

BACHELOR OF ARTS

Alexander Kirkland Barton, of Baltimore County, Md.
David Thomas Bowden, Jr., of Paterson, N. J.
Victor Horace Bridgman, Jr., of Baltimore County, Md.
Herbert Edgar Catlin, of Ridgefield Park, N. J.
Laurence Benjamin Chenoweth, of Baltimore.
Richard Gilmore Coblentz, of Baltimore.
Henry Evans Corner, of Baltimore County, Md.
Francis Asbury Davis, of Baltimore.
Edmond Sheppard Donoho, of Baltimore.
George Edwin Dorsey, of Baltimore.
John Lanahan Dorsey, of Baltimore.
Wallace Roylance Everton, of Baltimore.
Walter Frederick Geissel, of Baltimore.
Lawrence Getz, of Baltimore.
Albert Roland Gminder, of Baltimore.
Frederick Adam Hahn, of Baltimore.
Albert Lanphier Hammond, of Baltimore.
Nathan Bernard Herman, of Baltimore.
Guy Tilghman Orme Hollyday, of Baltimore County, Md.
Roger Howell, of Baltimore.
Samuel Jacob Keiser, of Baltimore.
Malcolm Horace Lauchheimer, of Baltimore.
Raymond Leibensperger, of Baltimore.
Frank Kimball Leland, of Howard County, Md.
Charles Sumner Levy, of Baltimore.
Carl Vernon Lynch, of Baltimore.
Israel William Nachlas, of Baltimore.
John Alexander Dushane Penniman, of Baltimore County, Md.
Clarence Chipley Porter, of Baltimore.
Donald Wayles Powers, of Baltimore County, Md.
Blanchard Randall, Jr., of Baltimore County, Md.
John Hubner Rice, of Baltimore County, Md.
Harry Walker Richmond, of Baltimore.
Louis Sachs, of Baltimore.
Aaron Schaffer, of Baltimore.
Carl Scharf, of Baltimore.
Arthur Martin Schoenewolf, of Baltimore.
Kemper Simpson, of Baltimore.
Joseph Clement Sinclair, of Baltimore.
Charles Irvin Snyder, of Baltimore.
Joseph Edward Snyder, of Baltimore County, Md.

Karl Josef Steinmüller, of Baltimore.
Harold Leo Stiebel, of Baltimore.
Cochran Supplee, of Baltimore.
Walter Degges Sutton, of Baltimore.
Carlos M. del Valle, of Santurce, Porto Rico.
Carl Jefferson Weber, of Baltimore.
Clifford Almon Wells, of Baltimore.
Steuart D'Ohl White, of Baltimore.
Milford Henry Whitehill, of Baltimore.
Lawson Wilkins, of Baltimore.
John Stevenson Long Yost, of Baltimore County, Md.

JOHNS HOPKINS UNIVERSITY CIRCULAR, No. 271

JANUARY, 1915

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1916

No. 1

THE

JOHNS HOPKINS
UNIVERSITY CIRCULAR

REPORT OF THE PRESIDENT
OF THE UNIVERSITY
1914-15

BALTIMORE, MARYLAND
PUBLISHED BY THE UNIVERSITY
ISSUED MONTHLY FROM OCTOBER TO JULY
JANUARY, 1916

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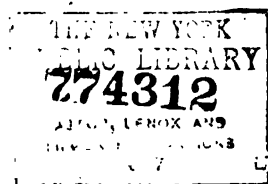
VOLUME XXXV

WHOLE Nos. 281-290

THE
JOHNS HOPKINS
UNIVERSITY CIRCULAR

1916

BALTIMORE
THE JOHNS HOPKINS PRESS
1916



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ANNUAL REPORT
OF
THE PRESIDENT OF
THE JOHNS HOPKINS UNIVERSITY
1914-15



BALTIMORE
THE JOHNS HOPKINS PRESS
1916

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1914-15

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THE JOHNS HOPKINS UNIVERSITY CIRCULAR

New Series, 1915, No. 1

JANUARY, 1916

Whole Number, 221

ANNUAL REPORT OF THE PRESIDENT

TO THE TRUSTEES OF THE JOHNS HOPKINS UNIVERSITY:—

Gentlemen:

I have the honor to submit to you my first annual report as President of the University, for the academic year ending June 30, 1915. Attached to this report are the reports from the different departments of the University which contain a statement both of the work done during the past year and of our present needs. The statement of these needs was made by the various departments at my request.

I deemed it wise to make this request both in order to acquaint myself with University conditions and to be in a position to inform you with regard to those conditions.

NEEDS OF THE UNIVERSITY

I shall not attempt to set forth in this place all of even our most pressing needs. Such a statement, if made, might be misunderstood. It might be regarded as in the nature of a catalogue of deficiencies, when it should be considered rather as a record of aspirations. A belief upon the part of those in charge of our departments of instruction that all

was well with them both as regards personnel and equipment would be evidence of a lack of vision, of a reliance upon past achievement, which is usually not a happy augury for future progress. There is, as was to be expected, evidence in these reports of a feeling throughout the institution that were greater facilities available more and better work might be done.

I shall refer all interested in particular lines of work to the reports of the several departments. At the same time I feel that I ought to acquaint you with the impression which a reading of these reports, as well as my year's experience as President, has made upon me. I have come to the conclusion that the University has two needs which must soon be met, if our work is to be carried on under the most favorable conditions. They are:

First: An increase in the salaries of quite a number of the teaching force. In a few instances it may be desirable to make provision for more instructors. But the principal need is an increase in the smaller salaries. Probably an annual increase in the budget of at least \$20,000 will be necessary in the not distant future. Immediately necessary increases of salary will require the addition of \$10,000 to our annual expenditure. Until such time as these salary inadequacies can be remedied, I am convinced that few, if any, increases in the teaching force should be made. We should endeavor to meet any demand that may be made for new instructors through a rearrangement of the work, if necessary, by an increase in particular cases in the work of our present instructors, to be accompanied by a corresponding increase in salary. We shall, of course, be obliged, so far as our resources permit, to meet the most insistent demands of the local community which has so generously supported us in the past and on whose continued support the future prosecution of our work is so largely dependent. But apart from meeting such demands we may properly set our face against a policy of expansion. We should certainly not add new departments until we have available the necessary funds. We may prop-

erly also refuse to enlarge existing departments, even if an enlargement of those departments is necessary to enable them to cover comprehensively the subjects to which they are devoted. Those at the head of every vigorous and successful department see many lines of work along which they rightly believe they could do successful work if they had the necessary support. But the specialization of knowledge has become so great that it is hopeless for any university to expect that its organization may cover comprehensively the entire field. It ought, of course, to have some departments which will cover satisfactorily their own branches. It must be content, however, if other departments are only incompletely representative of the work which might be done.

Indeed, it has seemed to me that the time has come for all higher institutions of learning to consider in all seriousness whether they are justified in requesting or even in receiving aid for the prosecution of work for which ample provision is made elsewhere. We may properly ask the local community in which we are placed for the means to meet local demands. We should not, it seems to me, ask either that community or the larger outside world for help in directions in which our efforts would result merely in inaugurating competition with other institutions already in satisfactory occupation of the field. Certainly we should not proceed in a policy of expansion from motives of institutional or local pride. For every university is under an obligation, which transcends all other considerations, to contribute to the best of its ability and in the most effective way to the general advancement of knowledge.

Second: Greater facilities must be offered in the future for carrying on the work of research and investigation which has always been and is now regarded as the principal work of the University. We must, if the best use is to be made of our opportunities, secure funds for research which may be used in the discretion of the departments concerned, either in providing for a temporary fellowship, for the purchase

of apparatus or books, or for the expense necessitated by the publication of the results of investigation.

It is not in the interest of efficient work to make provision for an investigator who has not available the necessary apparatus for carrying on his investigations or the means requisite for the publication of the results of his work. It would be far better to apply to the purposes of an existing department engaged in investigation any funds that may be available than to attempt with them to establish a new department insufficiently equipped. Wherever there is the prospect of securing additional funds, care should be taken also that such funds shall not be devoted exclusively to a particular purpose, such as the establishment of a permanent fellowship in a particular department. It may easily happen that there is no student in such a department to whom such a fellowship may profitably be awarded. If a department fund were available as well for another purpose, it would be possible under such conditions to apply it to much greater advantage.

HOMEWOOD

The past year would appear to mark the beginning of the end of the movement inaugurated so many years ago of transferring the work of the University to the site at Homewood. The Engineering Department has carried on the work of the year at the new site. The work of the Department of Plant Physiology has already for some years been conducted there in the laboratory provided for the purpose. The Botanical Garden, with its attendant greenhouses, has also been there for some time. This garden has not only served the purposes of our own Department of Botany, but as well has been used by the schools of the city, the pupils of which have in large numbers been in the habit of visiting it. The Power House, which serves also as a laboratory of Mechanical Engineering, is completed. The Academic Building is ready for occupancy. Finally, the Trustees of the University have

authorized the construction of the Civil Engineering Building, which it is hoped will be completed before the opening of the next scholastic year.

It was fortunate that those responsible for the planning of the new buildings at Homewood considered the future rather than the present needs of the departments of instruction to which those buildings were assigned. For, as a result, it has become possible, through a reassignment of space, to make satisfactory provision for the immediate future in the buildings already at our disposition for all the departments of the University, with the exception of the Department of Chemistry. It has been found possible thus to make provision for Zoölogy, Botany, and Psychology in the Academic Building, for Geology and the State Bureaus of the Geological Survey, Forestry, and Weather Service in the Civil Engineering Building now in process of erection, and for Physics in the present Engineering Building.

The most difficult problem connected with our proposed move to Homewood arises in connection with the Department of Chemistry. Our hopes for securing the funds for a new chemical laboratory have unfortunately not as yet been realized. Unless the move to Homewood is to be postponed, a proposition which in my opinion is not to be entertained, it will be necessary to make some temporary arrangement for the work of the Department of Chemistry. Of all the plans which have been proposed the following seems to be the most desirable: The work of the department will be divided. The graduate work for the present will remain where it is. Provision will be made for the undergraduate work by building at Homewood an addition of an inexpensive character to the gymnasium of the former Country School. The building to be constructed will make provision for undergraduate laboratories and lecture rooms. It is estimated that the cost involved will be between \$10,000 and \$15,000.

It would be possible, of course, to carry on the undergradu-

ate as well as the graduate work in the present quarters. But the consequent inconvenience to students and the decrease in the efficiency of the work would seem amply to justify the expenditure necessary to make the provision proposed for the undergraduate work in chemistry.

How long these arrangements for the laboratory departments can be satisfactorily continued depends, of course, upon the growth of the University. It is to be hoped that the demands to be made upon us in the near future will not exceed the facilities which our resources will permit us to offer. If they do, I suggest for your consideration the policy already adopted in the case of the Medical School, viz., that we endeavor by some effective method of selection to confine our instruction to those who are in our opinion best fitted to receive it. The Johns Hopkins University has never in its history sought numbers at the expense of quality of students. If such an arrangement is adopted, it will be possible to carry on our work until such time as we have the funds to construct the laboratories for which the Homewood plans make provision.

GRADUATE WORK IN CHEMISTRY

I must call your attention further to the great desirability of making satisfactory provision for carrying on the graduate work in chemistry at Homewood. We can, of course, for some time to come continue that work in the present laboratory without serious inconvenience. At the same time the efficiency of the work will unquestionably be increased if it is brought together with the undergraduate work. We must also remember that the present chemical laboratory may not remain indefinitely available. A new chemical laboratory, to be built in accordance with the plans which have been prepared and accepted, providing for both the graduate and undergraduate work in chemistry, is therefore, if not an absolute necessity, still an extremely desirable addition to the plant at Homewood. It might be possible to make pro-

vision for the graduate work in chemistry in the upper story of the Academic Building, but the peculiar characteristics of chemical work make it desirable, if not necessary, that the department of chemistry be housed in a building by itself.

FINANCIAL STATEMENT

The Financial Report, showing in detail the operations for the year ending June 30, 1915, and the condition of the University finances on that date, has been published, and copies may be obtained from the Treasurer by those interested. Reference to this report will reveal the following facts:

INCOME AND EXPENSE FOR THE YEAR

The operations of the year resulted in an excess of expenditures over income of....		\$64,115.55
On Philosophical and Collegiate account..	\$41,188.12	
and on Medical School account.....	22,927.43	
		<hr/>
The excess for the preceding year was.....		54,621.15
For Philosophical and Collegiate Departments	\$28,981.82	
For the Medical School.....	25,639.33	
		<hr/>
An increase this year of		\$ 9,494.40
It will be noted that the deficit on the Philosophical and Collegiate account increased during the year as compared with the year before		\$12,206.30
While the deficit in the Medical School decreased		2,711.90
		<hr/>
Making a net increase as above of.....		\$ 9,494.40
		<hr/>
The total income from operations for the year was....	\$521,205.69	
An increase this year of		\$71,845.24
This increase came from the following sources:		
Tuition	\$ 4,346.72	
Income from Invested Funds	54,362.74	
State of Md. Engineering		
School Appropriation....	10,655.75	
Other Items	2,480.03	

The increased income from Invested Funds is largely due to the William H. Welch Endowment for Clinical Education and Research, which became effective early in the year. This also accounts for much of the increase in Salaries and Expenses as shown below.

Of the total income, the amount received from students was 24 per cent., the income from invested funds 57 per cent., from the State of Maryland 12 per cent., and from other items 7 per cent.

The total operating expenses for the year were..... \$585,321.24

An increase for the year of..... \$81,339.64

The increase is accounted for as follows:

In salaries \$33,540.16

In expenses 48,528.43

\$82,068.59

Less decrease

In apparatus and

books \$468.95

In other items... 260.00

728.95

\$81,339.64

The amount paid for salaries during the year constituted 66 per cent. of the total expenses, the amount paid for expenses 29 per cent., and the amount paid for apparatus, equipment, and for other items 5 per cent.

From the foregoing figures it will be seen that the expenses of the University are growing faster than the income, which was already inadequate, and that the annual excess of expenditures over income, which should be extinguished, or at least diminished, is rapidly increasing. The total accumulated deficits from operation to June 30, 1915, were \$263,889.97.

GIFTS AND REQUESTS

From two anonymous donors we have received: (1) fifty thousand dollars, the income of which is to be paid by the

University to the donor during her life; (2) one hundred thousand dollars, the donor and his wife to receive the income during their lives.

Under the will of the late General William D. Gill, of Baltimore, the residue of his estate, subject to a life estate, was bequeathed to the University for the establishment of a chair of Forestry.

Under the will of the late Miss Mary E. Garrett the University is given for the purposes of the Medical School the remainder of her interest in her former Baltimore home.

In accordance with the expressed wish of the late Dr. Christopher Johnston, Jr., for many years Professor of Oriental History and Archæology, his widow has presented to the University for the library of the Oriental Seminary 252 bound volumes and about 100 pamphlets from his library.

Professor Edward H. Griffin gave to the University a sum of money for the purchase of books much needed in the Department of Philosophy, and about 250 volumes have been added to the library through his generosity. To this gift he added about 150 volumes from his private library.

Another noteworthy gift to the library is the "Benjamin I. Cohen Memorial," consisting of a collection of 333 miscellaneous volumes. This gift is due to the liberality of Mrs. Benjamin I. Cohen, of Baltimore, and includes a specially prepared bookplate.

A collection of drawings, numbering about 10,000, brought together by the late Sir Jonathan Hutchinson, of London, and of great value in medical study, has become the property of the University through the liberality of Mr. William A. Marburg, of Baltimore.

Shortly before his death Mr. Mendes Cohen, who had been a frequent benefactor of the University, presented a valuable collection of minerals consisting of about two thousand carefully selected and carefully catalogued specimens, together with the cabinet in which they were installed. This gift was generously supplemented with the sum of five hundred dollars, to be used primarily for the care of the collection.

Mr. Charles R. Schmidt, of Baltimore, has given the sum of five hundred dollars for the year 1915-16 to be used as the stipend of the "Ilse Schmidt Fellowship" in the Department of Chemistry. This gift is intended as a memorial of the daughter of Mr. Schmidt.

The Baltimore Board of Trade has established a scholarship in this University for the period of two years, the income of which (about \$200.00 per annum) will be applied to purposes of research along lines of particular interest to the State of Maryland. This scholarship is in the Department of Engineering. The Trustees will grant free tuition to the incumbent.

A portrait, in oil, of Dr. F. P. Mall, Professor of Anatomy, has been presented by some of his associates, the presentation being made on Commemoration Day.

Through the liberality of a member of the Board of Trustees it became possible to invite Ex-President Taft to visit the University and to deliver a lecture in McCoy Hall.

ASSETS AND LIABILITIES

(June 30, 1915)

The University has Assets as follows:

Stocks, Bonds, Productive Real Estate, etc., belonging to Endowment Funds	\$6,020,287.24
Bonds, etc., belonging to Special Funds	206,000.00
Plant, Equipment, etc.—	
Howard St. Buildings.....	\$ 990,189.16
Medical School Buildings.....	187,028.34
Homewood Land and Development..	1,959,114.73
Equipment, Books, etc.....	610,874.59
	<hr/>
	3,747,206.82
Accounts Receivable	87,739.13
	<hr/>
	\$10,061,233.19
From this should be deducted Bills Pay- able for money borrowed from Banks	55,000.00
	<hr/>
Making Total Net Assets (Book Value)	\$10,006,233.19

The Liabilities are as follows:

Permanent Endowments (Trust Funds):

Income for General

Purposes \$3,966,527.33

Income for Designa-

ted Purposes 2,285,367.10

6,251,894.43

Unexpended Income of Special Funds 49,996.00

Sundry Open Accounts 35,938.88

Engineering School Building Fund.... 258,855.34

Hunterian Laboratory Building Fund. 90,624.77

6,687,309.42

Leaving \$3,318,923.77

Which is represented by—

Plant, Equipment, etc.,..... \$3,747,206.82

Unrestricted Bequests 225,093.91

\$3,972,300.73

Against which has been charged

Loan on Investments... \$29,951.03

Deficit in Operations to

date 263,889.97

Homewood Development

in excess of Funds

available 359,535.96

653,376.96

\$3,318,923.77

These liabilities should be offset by cash on hand and good current assets. That such is not the case is due to the fact that the University has had to provide cash to meet the accumulated deficits of \$263,889.97 and an amount from General Account for Homewood Development, \$359,535.96, a total of \$623,425.93.

The University has an unrestricted legacy—the McCoy—of \$225,093.91, which, together with the proceeds of the University property on Howard street, when sold, could be applied to liquidate the above liabilities.

In addition to these present assets the University is interested as remainderman in a number of estates which will be

available on the termination of existing life estates. These amount in all to about \$900,000. There are, apart from the liabilities just enumerated, no debts or obligations except that under the will of John W. McCoy the University must pay an annuity, etc., of \$950, which will terminate on the expiration of the life tenancy.

But the needs of the University require, as shown by the recurring annual deficits of approximately \$65,000.00, not the use of the unrestricted legacy and the selling of University property for the payment of past deficits, but rather an increase of its endowment by at least a million and a half dollars, or better still, by two million dollars, to enable it to do its present work efficiently without incurring a deficit, and also the raising of a fund of approximately \$625,000 to pay off the present debts.

This financial statement and this list of gifts are in some respects most encouraging. In one most important particular, however, a very serious question is raised. On the one hand, the University was never so well off as at present, so far as concerns the amount of its endowment. Further, it has not, during its entire history, received such large gifts as it has received during the past year or two. Finally, it may look forward with certainty to a large increase in its available resources.

On the other hand, a perusal of our financial statement emphasizes the necessity of providing, even if in a temporary way, for the recurring excess of expenditure over income in the current operations of the University. There is only one way in which such provision may be made. This is by providing additional income. It may be possible to provide for the sudden expansion of a university. It is fatal suddenly to contract its work. The personal distress which would result from any such action, the effect upon the morale of the teaching force, the loss in institutional prestige, would be such as to destroy much of the work which it has taken years to build up. Any contraction in the work of the Uni-

versity must come gradually, if it comes at all. When a place becomes vacant as the result of the death or resignation of the incumbent, serious consideration must be given to the question whether the University will take measures to fill it or not. If, after deliberation, the decision is reached that the work can be done as well elsewhere, that place should not be filled until ample funds are available. There are few universities at the present time, as I have already pointed out, which can hope to have all their departments comprehensively organized. It would, of course, be a misfortune if a department which is now satisfactorily organized should lose in strength as the result of the failure to fill a vacancy in its staff. Nothing but the dictates of necessity should bring the trustees thus to diminish the effectiveness of a well-organized department.

PERSONAL MENTION

Professor Basil L. Gildersleeve resigned his professorship at the end of the academic year, to our great regret. Dr. Gildersleeve was the first professor called to join the faculty, and has performed the duties of his office uninterruptedly during the past thirty-nine years. The Trustees have recognized his invaluable services by asking him to continue his relations to the institution as Honorary Francis White Professor of Greek. He continues to edit the *American Journal of Philology*, which was established under his editorial direction nearly thirty-six years ago.

Professor Edward H. Griffin, who came to this University in 1889 as Professor of the History of Philosophy and Dean of the College Faculty, decided at the close of the year to withdraw from active work, and his resignation was accepted with regret. The Trustees have designated him Professor Emeritus. Dean Griffin had endeared himself to the students of the University and his retirement occasioned widespread regret. He is now enjoying what must prove a welcome respite from the exacting routine of the office of a College Dean.

Dr. Murray P. Brush, Collegiate Professor of French, has been appointed Acting Dean of the College Faculty for the year 1915-16.

Dr. Charles W. E. Miller, for many years Professor Gildersleeve's assistant in various phases of the department's work, has been made Professor of Greek, and has taken up the seminary and lecture work laid down by his illustrious preceptor.

Dr. Edward H. Spieker, Associate Professor of Greek and Latin for a long period, has been promoted to the rank of Collegiate Professor of Greek.

The following appointments and promotions have also been made:

In the Philosophical Faculty

DAVID M. ROBINSON, Ph. D., formerly Professor of Classical Archaeology and Greek Epigraphy, Professor of Classical Archaeology and Epigraphy and Lecturer on Greek Literature.

PAUL B. DAVIS, Ph. D., formerly Assistant Instructor in Chemistry.

HARRY BATEMAN, Ph. D., Lecturer in Applied Mathematics.

ELLIS MILLER, Ph. D., Instructor in Chemistry.

HENRY SLONIMSKY, Ph. D., Instructor in Philosophy.

In the Medical Faculty

LOUIS V. HAMMAN, M. D., formerly Associate, Associate Professor of Clinical Medicine.

JOHN T. GERAGHTY, M. D., formerly Associate, Associate Professor of Clinical Urology.

LEWIS H. WEED, M. D., formerly Instructor, Associate in Anatomy.

WALTER A. BAETJER, M. D., formerly Instructor, Associate in Clinical Medicine.

WILLIAM M. MARRIOTT, M. D., formerly Instructor, Associate in Pediatrics.

PAUL M. LAMSON, M. D., formerly Assistant, Associate in Experimental Therapeutics.

MONTROSE T. BURROWS, M. D., Associate in Pathology.

CHARLES C. MACKLIN, M. D., formerly Assistant, Instructor in Anatomy.

HARRY C. SCHMEISSER, M. D., Ph. D., formerly Assistant, Instructor in Pathology.

CHARLES A. LAUBACH, M. D., formerly Assistant, Instructor in Bacteriology and Hygiene.

ARTHUR L. BLOOMFIELD, M. D., formerly Assistant, Instructor in Medicine.

EVELETH W. BRIDGMAN, M. D., formerly Associate, Instructor in Medicine.

SYDNEY R. MILLER, M. D., formerly Assistant, Instructor in Clinical Medicine.

MARTIN F. SLOAN, M. D., formerly Assistant, Instructor in Clinical Medicine.

WILLIAM L. MILLER, M. D., formerly Assistant, Instructor in Obstetrics.

CECIL K. DRINKER, M. D., Instructor in Physiology.

SAMUEL GOLDSCHMIDT, M. D., Instructor in Pathology.

JAMES L. GAMBLE, M. D., Instructor in Pediatrics.

WARREN R. SISSON, M. D., Instructor in Pediatrics.

CHARLES A. WATERS, M. D., Instructor in Actinography.

VEADER N. LEONARD, M. D., Instructor in Gynecology.

ROBERT S. CUNNINGHAM, M. D., Assistant in Anatomy.

ADMONT H. CLARK, M. D., Assistant in Pathology.

WILLIAM C. DUFFY, M. D., Assistant in Pathology.

CALVIN H. GODDARD, M. D., Assistant in Medicine.

MILDRED CLARK, M. D., Assistant in Medicine.

ROGER P. BATCHELOR, M. D., Assistant in Surgery.

WILLIAM A. FRONTZ, M. D., Assistant in Urology.

FREDERICK W. HOBELMAN, M. D., Assistant in Clinical Urology.

H. P. MAUCK, M. D., Assistant in Clinical Orthopedic Surgery.

S. SHELTON WATKINS, M. D., Assistant in Clinical Laryngology.

LEWIE M. GRIFFITH, M. D., Assistant in Clinical Laryngology.

HAROLD L. HIGGINS, M. D., Assistant in Pediatrics.

DANIEL DAVIS, M. D., Assistant in Obstetrics.

ROSCOE W. HALL, M. D., Assistant in Psychiatry.

MARY A. HODGE, M. D., Assistant in Clinical Medicine.

EMIL NOVAK, M. D., Instructor in Clinical Gynecology.

CAROLINE B. TOWLES, M. D., Assistant in Clinical Medicine.

ALMA HILLER, A. B., Assistant in Medicine.

ALMA S. ROTHHOLZ, M. D., Assistant in Laryngology.

JOHNSTON SCHOLARSHIPS

The Johnston Scholarships have been held by Harry Bateman (Ph. D., Johns Hopkins, 1913), who, after a three-year tenure of the scholarship, has been appointed Lecturer in Applied Mathematics in this University; Eugene W. Burlingame (Ph. D., Pennsylvania, 1910); John L. Campion

(A. M., Columbia, 1912). Dr. Burlingame has been reappointed for 1915-16. The other appointees are Clarence W. Hewlett (A. M., Johns Hopkins, 1911, Ph. D., 1912, and Assistant in Physics, 1914-15), and Karl S. Lashley (Ph. D., Johns Hopkins, 1914, Fellow and Bruce Fellow in Zoology, 1913-15).

INAUGURATION OF THE PRESIDENT

The formal installation of the new President of the University was held at Homewood, in the Academic Building, on the twentieth of May; and on the following day the new buildings, the Academic Building and the Laboratory of Mechanical and Electrical Engineering, were formally dedicated, with addresses by Professor Henry C. Adams, of the University of Michigan, the first graduate of this University, and General George W. Goethals, Chief Engineer of the Panama Canal. An extended account of the exercises of the two days is printed in the *University Circular*, June, 1915.

COMMEMORATION DAY

The exercises of Commemoration Day, the thirty-ninth anniversary of the opening of the University, were held at 11 o'clock in the morning of February 22, in McCoy Hall. The chaplain was Dr. William W. Guth, President of Goucher College, and the orator of the day was Dr. Nicholas Murray Butler, President of Columbia University, his subject being "Some Matters Academic." A portrait in oil of Dr. Franklin P. Mall, Professor of Anatomy, was given to the University by colleagues and friends of Dr. Mall, the presentation being made by Dr. L. F. Barker. The President of the University, who presided at the exercises, spoke at some length on the growth and needs of the University. The degree of Doctor of Medicine was conferred upon one candidate and that of Bachelor of Arts upon one. In the evening the annual meeting and banquet of the general Alumni Association were held at the Hotel Emerson.

An account of the public exercises, including the two addresses, and of the Alumni gathering is given in the *University Circular*, February, 1915.

CONFERRING OF DEGREES

Degrees were conferred Tuesday, June eighth, at four o'clock, in the Academy of Music. Prayer was offered by the Rev. Oliver Huckel, D.D., pastor of the Associate Congregational Church, Baltimore, and degrees were then conferred as follows: Bachelor of Arts, thirty-five; Bachelor of Science in Engineering, three; Master of Arts, twelve; Doctor of Philosophy, thirty-one; Doctor of Medicine, eighty-eight. The President of the University made a brief address to the recipients of degrees. The list of appointments in the faculty for the ensuing year and of honors won by the students was then read. In the evening the usual reception in honor of the graduates and their friends was held in McCoy Hall. A report of the exercises appears in the *University Circular*, July, 1915.

ACADEMIC CELEBRATIONS

The University has been represented at various academic and scientific gatherings, among them the one hundred and fiftieth anniversary of Brown University, the President of this University and Professor Bloomfield being the delegates; the Association of American Universities, the delegate being the President of the University; the inauguration of President Graham, of the University of North Carolina, this University being represented by its President; the fiftieth anniversary of Worcester Polytechnic Institute, Professor Tilden being our representative; opening of the new medical buildings of Washington University, Professor Janeway representing this University.

AWARD OF PRIZES

The Severn Teackle Wallis Memorial Prize was given on Commemoration Day to Frederick Courtney Tarr (A. B., 1915), for his essay entitled "A Study in Galdos."

The Adams Prizes, offered to the winners of the annual inter-class debate, were awarded to Alfred S. Niles, Jr., Harrison C. Coffin, and Thomas J. Tingley, representing the junior class; and the Adams Medal for excellence in public speaking was awarded to Alexander A. Steinbach, of the second-year class.

PUBLICATIONS

The various serial publications of the University have appeared as usual. The list now includes the following journals:

The American Journal of Mathematics, in its thirty-seventh volume; the American Journal of Philology, in its thirty-sixth volume; Studies in Historical and Political Science, of which the thirty-third series is in progress, and several extra volumes have been issued; Modern Language Notes, of which twenty-nine volumes are completed; and the University Circular, two hundred and sixty-eight numbers of which have appeared. The Contributions to Assyriology, Hesperia, the Elliott Monographs in the Romance Languages, the Journal of Terrestrial Magnetism, and occasional Memoirs from the Biological Laboratory, are also issued under the editorial direction of university professors.

PUBLIC LECTURES AND ASSEMBLIES

The twentieth series of Percy Turnbull Memorial Lectures on Poetry was given by Sir Walter Raleigh, Professor of English Literature in the University of Oxford, April 8-15. The course included six lectures on "Poetry and Criticism of the Romantic Revival."

The eighth course of lectures on the Herter Foundation was given early in October by Dr. Thomas Lewis, Lecturer on Diseases of the Heart, University College Hospital Medical School, London, who gave three lectures on the subject of clinical medicine and laboratory methods, with special reference to recent work in cardiography.

The seventh course of lectures in Historical and Political Science on the James Schouler Foundation was delivered by Professor William A. Dunning, of Columbia University, January 25, 26, February 1 and 2, his general subject being "Early Phases of Nineteenth-Century Political Theory."

Mrs. Alma Webster Powell, Ph. D., of New York, gave a lecture recital, entitled "Music as a Human Need," November 16.

Dr. William Cunningham, Fellow of Trinity College, Cambridge, and Archdeacon of Ely, gave three lectures on "Town Planning," "Municipal Buildings," and the "Township in England," November 17, 19, and 20.

Dr. and Mrs. William Hunter Workman gave a joint lecture describing their explorations in the Himalayas, November 18.

Professor Felix von Luschan, of the University of Berlin, gave two lectures on "Excavation of the Hittite Capital" and "Anthropology of Western Asia," December 14, 15.

Mr. Owen Wister, of Philadelphia, gave a lecture on "Superstition and the Doctor," under the auspices of the Johns Hopkins Hospital Historical Society, December 14.

Dr. Esther B. Van Deman, of Rome, Italy, lectured on "Roman Outposts in North Africa," January 8.

Professor Kuno Meyer, of the Universities of Berlin and Liverpool, gave two lectures on "Ancient Irish Poetry" and "Races and Languages of Great Britain and Ireland," January 11 and 12.

Dr. Luther Anderson, late of the Imperial University of Peking, gave a lecture on "Chinese Architecture," January 15.

Mr. Frederick Vining Fisher, of the Panama-Pacific Exposition, described "The Panama-Pacific Exposition, the Rocky Mountain Country, and the Panama Canal," January 27.

Mr. Harrington Emerson, of New York, gave a series of four lectures on "Personal and Industrial Efficiency," under the especial auspices of the Department of Engineering, March 15, 22, April 12 and 19.

Dr. John C. Ferguson, formerly President of Nanking University, China, lectured on "Chinese Art," March 22.

Dr. David T. Day, of the United States Bureau of Mines, gave two lectures on "Petroleum," March 23 and 24.

Professor Douglas W. Johnson, of Columbia University, lectured April 8 on the "Surface Features of Europe as a Factor in the Present War."

Mr. Bailey Willis, of Washington, D. C., gave an account of his recent "Geological Observations in Southern South America," April 16.

Hon. William H. Taft, formerly President of the United States, spoke on "The Executive Function of Government," April 24.

Mr. Leonard Charles Van Noppen, Queen Wilhelmina Lecturer in Columbia University, gave a course of five lectures on "Dutch Literature and History," April 26-30.

Rev. John N. Mills, of Washington, D. C., gave a lecture on "The Progress and Prospects of China," May 6.

The following courses or single lectures were given before various departments of instruction :

Professor Clarence W. Alvord, of the University of Illinois, ten lectures on "The Partition of the West in 1783," on the Albert Shaw Foundation.

Dr. Luther Anderson, sometime Professor in the Imperial University of Peking, five lectures on "The Problem of the Pacific."

Professor Ernst Freund, of the University of Chicago, six lectures on the "Principles of Social Legislation."

Professor James W. Garner, of the University of Illinois, four lectures on "French Administration and Judiciary."

Miss Josephine Goldmark, of the National Consumers' League, two lectures on "Fatigue and Efficiency in Relation to Social Legislation."

Dr. Henry J. Harris, of the Library of Congress, on "Workmen's Compensation Legislation," five lectures.

Mr. Logan G. McPherson, Director of the Bureau of Railway Economics, five lectures on "Railway Transportation."

Dr. James Brown Scott, Secretary of the Carnegie Endowment for International Peace, two lectures weekly through the year on "International Law and Diplomacy."

Professor Edward P. Dargan, of the University of Chicago, eight lectures weekly during February and March on topics in French Literature.

Professor George L. Hamilton, of Cornell University, on "Parallels to the Rainmaking Fountain in Yvain," one lecture.

Professor Richard T. Holbrook, of Bryn Mawr College, one lecture on "Patelin."

Professor Frederick M. Warren, of Yale University, on "An Eastern Origin for the Plot of the *Roman de la Rose*," one lecture.

The eighteenth annual Inter-class Debate and Contest in Public Speaking by students of this University were held in McCoy Hall January 29. The subject of the debate was the policy of colonial expansion, and the winners were the junior debaters. The public speaking contest was won by Alexander A. Steinbach, of the second-year class.

The third Triangular Intercollegiate Debate (the fourteenth annual contest) took place April 24, the contestants being, as in the two previous years, students of this University, the University of North Carolina, and the University of Virginia; the general subject was "Colonial Expansion." The North Carolina and Virginia debaters met in McCoy Hall; the two Johns Hopkins "teams" visiting Charlottesville and Chapel Hill respectively and winning both contests.

The third annual debate between the Zelosophic Society of the University of Pennsylvania and the Grotius Society of this University was held in McCoy Hall, April 26. The subject was "Colonial Expansion," and the laurels were awarded to the Johns Hopkins debaters.

The fifth annual contest for Maryland and the District of Columbia of the Intercollegiate Peace Association was held in

McCoy Hall, March 19, the representative of Loyola College, Baltimore, being declared the winner.

The oratorical contest of the Intercollegiate Peace Association for the fourth Atlantic Group, consisting of the District of Columbia, Maryland, North Carolina, Virginia, and West Virginia, was held in McCoy Hall, April 30, the representative of West Virginia bearing off the palm.

The University halls have been used by the organizations named below for lectures and public meetings:

The Municipal Art Society of Baltimore—Mr. Lorado Taft, on "Some Recent Tendencies in Sculpture," November 17; Mr. Christian Brinton, on "Contemporary Painting," December 15; Professor A. D. F. Hamlin, on "Contemporary Architecture," January 21; Mr. Troy Kinney, on the "Dance as an Expression of Art," February 16; Professor Hans Froelicher, on "Aspects of the Walters Art Gallery," March 18; Mr. Joseph Lindon Smith, on "Pageantry," April 13; Mr. Thomas S. Clarke, on "Garden Pictures in Color," May 11.

The Archæological Institute of America, Baltimore Society, —annual meeting, followed by a lecture by Professor Howard Crosby Butler, of Princeton, on "American Excavations at Sardis," November 23; Professor Walter Dennison, of Swarthmore College, on the "Military Operations of Julius Cæsar in France and Belgium in relation to the Present European War," January 22; Professor Clarence Ward, of Rutgers College, on the "Rheims Cathedral and Its Place in Mediæval Art," February 17.

Under the joint auspices of the Municipal Art Society and the Archæological Institute, a lecture by Professor Mitchell Carroll, of George Washington University, on "Athens, Rome, and Washington as Types of the City Beautiful," May 4.

Under the joint auspices of the Teachers College Club of Maryland, the Educational Society of Baltimore, and the Faculty of the Baltimore Teachers Training School, a lecture by Dr. James E. Russell, Dean of Teachers College, New

York, on "German Education—Its Present Significance to American Teachers," December 11.

Under the auspices of the Alliance Française, a course of eight historical lectures on "La Frontière du Rhin depuis Jules César à 1914" was conducted by Count Wierzbicki, on Saturday mornings, December-February.

Professor John Bassett Moore, of Columbia University, spoke on "American Contributions to International Law," before the Columbia University Alumni Club of Maryland, May 7.

In addition the following meetings: Maryland Auxiliary of the Mission to Lepers (lecture by Miss B. Y. Johnson, Field Secretary of the United States Mission), October 29; the Women's Civic League, October 30 (address by President Goodnow), and November 24; the National Municipal League (two evening sessions), November 18 and 19; the Maryland High School Teachers' Association, November 20; the School Arts League, November 24 and February 26; the Parents' League of Baltimore, January 8; the Consumers' League of Maryland, January 9; Society of St. Vincent de Paul, annual public meeting, January 25; a discussion of the "Higher Biblical Criticism," by Professor Louis Wallis, of Chicago, February 8; a public meeting in the interest of the Skin and Cancer Hospital, February 23; the City Club of Baltimore and the Women's Civic League (address by Dr. Charles Zueblin, on the "New Civic Spirit"), February 24; the Maryland Peace Society, February 26 (address by Dr. H. W. Mabie on "The East and the West: Friends or Enemies"), and March 23; the History Teachers Association, April 16 and 17; Federation of Women's Clubs of Maryland, April 21 and 22; the Federated Charities of Baltimore, May 18; Children's Fresh Air Society, May 25.

Under the auspices of the Social Service Corporation, the physical lecture-room was used several Wednesday evenings for a series of lectures on various aspects of social service; and the first of a course of lectures by Dr. Edward T. Devine, of

New York, on "Social Construction," was given in the evening of February 22 in McCoy Hall, the remaining lectures being transferred to a larger auditorium. Dr. Devine also conducted an afternoon class for social workers on Monday afternoons in March, in the Donovan Room.

BUREAU OF APPOINTMENTS

The Bureau of Appointments, which was organized last year under the directorship of Dr. R. V. D. Magoffin, has been active. Its object is to secure permanent positions for graduates of the University or for resident students, or employment for resident students desiring to earn their expenses in whole or in part. The Committee on Appointments consists of Dr. Magoffin, as chairman, Professors Buchner, Mathews, Tilden, and French. An interesting statement of the operations of the Bureau during the year is appended to this report.

OPPORTUNITIES FOR TEACHERS

The College Courses for Teachers, given in coöperation with Goucher College, and the Summer Courses continued to offer valuable opportunities to teachers and others. The former have been in operation for six years and were attended in 1914-15 by 189 persons; the latter attracted 428 in 1915. In the appendix will be found extended reports on these phases of the University work from the Director, Professor Buchner. Graduate courses were offered for the first time in the summer of 1915, and sixty-five graduate students were enrolled, most of whom were candidates for the degree of Master of Arts. Many of the regular graduate courses also were opened, at convenient hours, to teachers who were seeking to secure credits towards advanced degrees.

UNIVERSITY VISITOR TO SOUTHERN COLLEGES

During the first two weeks in May, 1915, Professor John B. Watson visited several Southern colleges as University

Visitor. The following institutions were included in the itinerary: The University of Florida (Gainesville); Charleston College and The Citadel (Charleston); The University of South Carolina (Columbia); Furman University (Greenville, S. C.); Wofford College (Spartanburg, S. C.); Davidson College (Davidson, N. C.); Trinity College (Durham, N. C.); The University of North Carolina (Chapel Hill); Agricultural and Mechanical College (West Raleigh, N. C.). These visits were in general quite informal, but in several institutions public lectures had been arranged. In three or four of the institutions both a public lecture and a lecture before the psychology department were given. The University Visitor was received everywhere with great cordiality. The colleges of the South take kindly to the precedent that the University has established in sending out a University Visitor each year, and many of the individual professors expressed the hope not only that the custom would be continued, but that the President of this institution would, at an early date, appoint himself as University Visitor to the Southern colleges.

THE GRADUATE DEPARTMENTS

The work of the various graduate departments is outlined in the several statements appended to this report. Nothing of great moment has characterized the past year in those departments. The work has progressed satisfactorily and has maintained its character. The pressing needs of the scientific departments have already been sufficiently emphasized. Those needs are new laboratories on the new site at Homewood.

THE COLLEGE

During the year 1914-15 important changes were made in the curriculum and regulations of the College. Upon the recommendation of a Committee of the Board of Collegiate Studies, consisting of Messrs. Ames, Hulburt, Barnett, Tilden and Roulston, the following changes were adopted:

I. In lieu of the former somewhat rigid five-group system of studies, five new groups are established, namely:

1. Latin, Greek, Classical Archæology, Hebrew, Comparative Philology.
2. English, French, German, Spanish, Italian.
3. History, Economica, Political Science, Philosophy, Chemistry.
4. Philosophy, Mathematics, Physics, Astronomy.
5. Zoology, Botany, Chemistry, Geology, Psychology.

A student, at the end of his first year of residence, must select one of the subjects found in these groups as his major. In order to satisfy the requirements for the degree of Bachelor of Arts, the student must follow at least two courses in his major subject and at least two courses in a cognate subject, subject to the approval of his adviser.

II. Students in their first year of residence must take English Composition, French or German, two of the following four subjects, Latin, Greek, Mathematics and Physics, and Physical Training.

III. The following courses must be taken by all students: English Composition 1, Philosophy 1, one course each in English Literature, French and German, a course in History, Political Economy, or Political Science, a laboratory course, a one-hour course in Public Speaking and one year of Physical Exercise.

Additional credit of one unit is given to any student who takes three courses in any of the following subjects: English Composition, English Literature, any one of the foreign languages, History, Political Economy, Political Science.

IV. Courses are to be weighted as follows: for each hour of lecture or recitation, two units; for each hour of Public Speaking and of conference in Mathematics, one unit; for each hour and a half of laboratory work, one unit.

V. For the degree of Bachelor of Arts a student must have completed one hundred and twenty-five units.

VI. Instead of the present system of assigning advisers, a certain number of instructors are to be selected by the Dean to act as advisers of first-year students. At the end of his first year of residence, when the student selects his major subject, the instructors of the group in which that subject is found shall assign to him an adviser, who shall henceforth direct the selection of his studies.

VII. A student who is conditioned in a course must remove that condition by October 15 following, or he may not count the course toward his degree.

VIII. At the time of the informal reports in November and February only those students shall be reported whose work is unsatisfactory.

IX. There shall be the following standing committees, nominated by the Dean and elected by the Board of Collegiate Studies:

1. On Academic Rules and Regulations.
2. On Admission and Advanced Standing.
3. On Curriculum.
4. On Scholarships and Honors.
5. On Student Affairs.
6. On Summer Courses and Courses for Teachers.

THE MEDICAL DEPARTMENT

The past year has been signalized by a number of matters of importance in the Medical Department. The three departments of Medicine, Surgery, and Pediatrics have been reorganized as a result of the gift to the University by the General Education Board of the William H. Welch Endowment for Clinical Education and Research. As a result material additions have been made to our facilities both for teaching and research. A part of the gift from the General Education Board was intended for the erection of a laboratory. The construction of the new Hunterian Laboratory has been begun. The building will be completed some time during next spring and will offer greatly increased facilities for experimental work. The opening in May of this year of

the James Buchanan Brady Urological Institute, with an amply equipped laboratory, will, in addition to the hospital accommodations which it supplies, offer increased opportunities for instruction and research to students and physicians desiring to perfect themselves in Urology.

Notwithstanding the great progress made during the past year in the Medical Department, there are many things which need to be done in that department if it is more closely to approximate the ideals and carry out the purposes of the medical staff. Mention is made in the report of the Dean of the most pressing needs.

THE ENGINEERING DEPARTMENT

During the year several important steps were taken in the organization of the department. The most important is the complete removal of the work to Homewood. The Electrical and Mechanical Engineering Building was completed in September, and all professional courses have been conducted in this building since the opening of the academic year 1914.

The building has fully met our expectations as a modern and fully well-equipped plant for giving instruction in engineering. The power station which contains much of the equipment of the Department of Engineering was completed early in the year. Many features of the power station were designed for purposes of instruction and have amply realized the expectations which were held as to their usefulness. The erection of the new building for Civil Engineering on the west side of the south quadrangle has been begun, and it is expected that the building will be ready for occupancy by the end of the summer of 1916.

In the appendices to this report will be found the statements of the various departments of the University. Those who are interested in the particular branches of University work are referred to these statements for information.

Respectfully submitted,

FRANK J. GOODNOW,
President.

June 30, 1915.

REPORTS ON THE INSTRUCTION IN THE CHIEF BRANCHES OF STUDY

Prepared by the Principal Instructors in the Several Departments

MATHEMATICS

GRADUATE COURSES

Professor Morley gave the following courses:

1. Higher Geometry. *Three hours weekly, first half-year.*

After an introduction to the theory of algebraic curves and surfaces, under collineations, the theory of eliminants was considered. The plane quartic curve was then discussed in detail.

2. Theory of Functions. *Three hours weekly, second half-year.*

The theory of elliptic functions was developed with especial reference to applications.

1. Theta Modular Functions. *Two hours weekly through the year.*

In this course theta and theta modular functions were studied with particular reference to their connections with finite groups and finite geometries, and with configurations in projective geometry.

2. Theory of Probability. *Two hours weekly, second half-year.*

After developing the elements of the subject some of the applications of the theorems of Bernoulli and Poisson were considered. The course closed with an account of the theory of error and the method of least squares.

Dr. Cohen gave the following course:

Calculus of variations. *Two hours weekly through the year.*

The course included a detailed study of the subject in the case of a simple integral with either final or variable end points. Continuous and discontinuous solutions were investigated, and the isoperimetric problem was discussed at length. Many illustrative examples, including the classic ones, were treated.

Dr. Bateman gave a course on the differential equations of mathematical physics. *One hour weekly.*

This course covered the theory of linear equations, Riccati's equation, partial differential equations of the second order and Maxwell's equations.

The Seminary and reading class met each week.

The American Journal of Mathematics is in its thirty-seventh volume. With the January number was published a portrait of John Napier.

The degree of Doctor of Philosophy was conferred on C. P. Sousley, and that of Master of Arts on Miss T. Cohen, J. N. Galloway, and Miss E. V. Thompson.

The undergraduate courses were conducted by Professor Hulburt, Associate Professors Coble and Cohen, and Dr. W. F. Shenton.

Dr. H. Bateman, who has been a Johnston Scholar for three years, has been appointed Lecturer in Applied Mathematics for the year 1915-16.

I take this opportunity to emphasize the very great value to the University of foundations like the Johnston Scholarships; and to express a hope that the number of such foundations may be increased, until every department which is concerned with the eternal verities has one at its disposal when occasion arises.

PUBLICATIONS

A. B. COBLE.

Restricted Systems of Equations (second paper): *American Journal of Mathematics*, Vol. 36, 1914, pp. 395-418.

Point Sets and Allied Cremona Groups (Part I): *Transactions of the American Mathematical Society*, Vol. 16, April, 1915.

Point Sets and Allied Cremona Groups (résumé): *Proceedings of the National Academy of Sciences*, Vol. I, April, 1915.

H. BATEMAN.

The Mathematical Analysis of Electrical and Optical Wave Motion on the basis of Maxwell's equations. Cambr. Univ. Press, 1915.

The Structure of the Aether. *Bull. Amer. Math. Soc.*, March, 1915.

A porism occurring in the theory of Maxwell's equation and a method of finding the lines of electric force due to a moving point charge. *Amer. Journ. of Mathematics*, April, 1915.

On certain solutions of Maxwell's equations. *Messenger of Mathematics*, 1915.

The main results of the students' participation in the activities of the department are given in the July *University Circular*.

FRANK MORLEY,
Professor of Mathematics.

PHYSICS

The Physical Laboratory has been open daily during the year for the work of advanced and undergraduate students. Regular courses of lectures have been given, and meetings have been held weekly for the reading and discussion of the current journals. The Physical Seminary has met once each week and the list of papers presented is given below.

The regular courses of instruction were as follows:

By Professor Ames:

1. Physical Seminary. *One hour weekly, through the year.*
2. General Physics: Electricity and Magnetism. *Four hours weekly, through the year.*
3. Undergraduate Physics I. *Two hours weekly, through the year.*
4. Journal Meeting. *One hour weekly, through the year.*

By Professor Wood:

Physical Optics. *Three hours weekly, through the year.*

By Professor Bliss:

Undergraduate Physics II. *Three hours weekly, through the year.*

By Associate Professor Pfund:

Undergraduate Physics III. *Three hours weekly, first half-year.*

By Associate Professor Anderson:

General Astronomy. *Three hours weekly, through the year.*

By Dr. Charles F. Meyer:

Demonstrations of Experiments in Radioactivity. *One hour weekly, through the year.*

The work in undergraduate Physics I, II and III was carried out in part by several assistants: Dr. Hewlett, Mr. R. C. Dingleline, Mr. F. A. Ferguson, Mr. A. F. Gorton, Mr. R. W. Dickey, and Mr. F. L. Mohler.

The laboratory work for undergraduates has been under the direction of Professor Bliss and Dr. Pfund, with the assistance of Dr. Hewlett and Messrs. Ferguson, Dickey, Dingleline and Mohler. The work in the Astronomical Observatory was under the direction of Associate Professor Anderson with the assistance of Dr. MacKenzie. The advanced work and the original investigations have been under the direction of Professors Ames, Wood, Pfund, and Anderson.

In the Physical Seminary papers on the following subjects were read as follows:

Dr. J. A. Anderson—Theories of Gravitation.

Dr. D. MacKenzie—The Determination of Longitude.

Mr. A. F. Gorton—Recent Work on Thermionics and Photo-electricity.

Mr. E. O. Hulburt—Röntgen-ray Spectra.

Miss M. H. Barton—Life of James Clerk Maxwell; Experiments on Electric Convection.

Mr. W. S. Brown—Modern Practice in Wireless Telegraphy.

Mr. S. M. Burka—Radioactive Atoms; The Electric Standards, Weston Cell, Voltmeter, Mercury Ohm.

Mr. R. W. Dickey—Theories concerning the Structure of the Atom; Gauss' Experiments on Permanent Magnets.

Mr. R. C. Dingleline—The Absolute Measurement of Electric Current and of Potential Difference; Measurement of Low Temperatures.

Mr. F. A. Ferguson—The Laws of Ohm and Coulomb.

Mr. W. B. Hughes—The Life of Henry Cavendish.

Mr. F. L. Mohler—The Absolute Measurement of Electric Resistance; The Measurement of Low and High Pressures.

Miss M. L. T. Morse—Biographies of Faraday and Henry; History of various Electrostatical Experiments.

Mr. A. D. Power—The Phenomena of Atmospheric Electricity; Theories of Thermo-electricity.

Mr. M. W. Pullen—Measurement of Electrical Capacity and Dielectric Constants.

Mr. V. Voss—Theories of Metallic Conduction; The Laws of Spectral Series.

Miss L. Wilson—Measurement of the Ratio of the Electrical Units; The Derivation of Ampère's Law.

There were fourteen advanced students who followed Physics as their principal subject; of these two absolved the requirements for the degree of Doctor of Philosophy, and two those for the degree of Master of Arts. Their names and the titles of their dissertations, or essays in the latter cases, are as follows:

Mr. A. F. Gorton—Reflection from, and Transmission through, Rough Surfaces.

Mr. E. O. Hulburt—The Reflecting Power of Metals in the Ultra-Violet Region of the Spectrum.

Mr. R. W. Dickey—The Structure of the Atom.

Mr. W. B. Hughes—Analysis of Sound Waves.

Dr. J. A. Anderson and Dr. D. MacKenzie have had charge during the year of the ruling of diffraction gratings. They have also undertaken the construction of a new ruling engine for large gratings with high dispersion.

The laboratory has had during the past winter several guests who were invited to carry on their investigations here; among these may be noted Professor C. E. Mendenhall of the University of Wisconsin, Professor Masamichi Kimura of the University of Kyoto.

Various instructors in the laboratory have been actively engaged along various lines of investigation, but few of them have been as yet published. Professor Ames has ready for publication two articles—one dealing with a new mode of approach to the science of Electrodynamics; the other a critical study of the fundamental assumptions in Thermodynamics.

Professor Wood has been engaged during the year in several investigations: The Resonance Spectrum of Iodine; the Photography of the Moon in Ultra-violet Light; in collaboration with Dr. C. F. Meyer, upon a New Type of Radiation from the Electric Spark; and also a beautiful method for the study of the reflection of gas molecules.

Dr. Pfund has continued his investigation upon the variation of the electrical conductivity of different substances with light stimulation, and has also made a very important study of the character of optical glass suited for the protection of eyes under conditions which are not uncommon both in laboratories and in the manufacturing industries.

Dr. Anderson has made some striking photographs of the lines in the mercury spectrum under high dispersion and by a careful study of these he has at least removed all uncertainties as to their structure. In collaboration with Dr. MacKenzie he has also prepared photographs of the absorption spectrum of iodine, which will be most useful for many spectroscopic purposes.

The list of actual publications prior to June 1, is as follows:

PUBLICATIONS

R. W. Wood.

Separation of Close Spectral Lines for Monochromatic Illumination. *Philosophical Magazine*, March, 1914, p. 524.

(with G. Hemsalech).

Fluorescence of Gases Excited by Ultra-Schumann Waves. *Phil. Mag.*, May, 1914, p. 899; *Phys. Zeit.*, June, 1914, p. 572.

(with L. Dunoyer).

The Separate Excitation of the Centers of Emission of the D Lines of Sodium. *Phil. Mag.*, June, 1914, p. 1018.

(with L. Dunoyer).

Photometric Investigation of the Superficial Resonance of Sodium Vapor. *Phil. Mag.*, June, 1914, p. 1025.

Radiation from Gas Molecules excited by Light. *Proc. London Phys. Soc.*, June, 1914. (First Guthrie Lecture).

(with G. Riband).

The Magneto-optics of Iodine Vapor. *Phil. Mag.*, June, 1914, p. 1009.

Recommendations.—I cannot close this report without calling the attention of the authorities of the University to the need of increased appropriations for the purchase of apparatus and for the maintenance of shops, etc. Without these the character of investigations undertaken and the rapidity with which new ideas can be investigated are all hampered. Sir J. J. Thomson, the distinguished head of the Cavendish Laboratory in England, once said that the ideal laboratory was one with a series of large rooms and a bank account. It is impossible to carry on work in Physics without a constant renewal of old apparatus and, in many cases, a substitution for it of modern instruments. Everything that is used in a Physical Laboratory is expensive. As a consequence the one great need of our laboratory today is an appropriation of at least twice that which is at present given us.

JOSEPH S. AMES,

Director of the Physical Laboratory.

CHEMISTRY

INSTRUCTION

The following courses of instruction were given in the Chemical Department:

I. *An elementary course of experimental lectures* accompanied by classroom conferences and examinations, and extending through the year.

II. *A laboratory course*, also extending through the year, which was taken simultaneously with Course I, and was designed to familiarize beginners with the experimental side of chemistry.

Courses I and II were under the direction of Professor Gilpin, who was aided by a lecture assistant and two laboratory assistants.

III. *Systematic Inorganic Chemistry*, a lecture course extending through the year, which was taken by undergraduates who had previously completed courses I and II, and by some graduates from other institutions.

IV. *A laboratory course*, extending through the year, in the reactions and preparations of inorganic compounds and in quantitative and qualitative analysis. This course was taken in conjunction with course III.

Courses III and IV were under the direction of Associate Professor Lovelace, who was aided by two laboratory assistants.

V. *Systematic Organic Chemistry*, a course of lectures given by Professor Gilpin, which extended through the year, and was taken by the more advanced undergraduates and by the less advanced graduates from other institutions.

VI. *A laboratory course* under the direction of Professor Gilpin in the reactions and preparation of organic compounds.

VIII. *Advanced Inorganic Chemistry*, a course of lectures by Associate Professor Lovelace, which extended through the year.

VIII. *Advanced Organic Chemistry*, a course of lectures extending through the year, by Associate Professor Reid.

IX. *A laboratory course*, extending through the year, in the reactions and preparation of organic compounds; by Associate Professor Reid.

X. *Laboratory Methods*, a course of lectures extending through one half-year, by Professor Morse.

XI. *Quantitative Chemistry*, a laboratory course extending through the year, by Professor Morse and Associate Professor Frazer.

XII. *Physical Chemistry*, a course of lectures extending through the year, by Professor Jones.

XIII. *Physical Chemical Methods*, a laboratory course conducted by Professor Jones.

XIV. *Advanced Graduate Chemistry.*

This is a composite course of two or three years duration given by the members of the teaching staff, in which selected important topics in chemistry are discussed with greater thoroughness than is practicable in the more elementary courses.

The following courses under schedule XIV were given during the past academic year:

By Professor Remsen: The Early History of Chemistry.

By Professor Jones: Radiochemistry.

By Associate Professor Reid: The Chemistry of the Terpenes.

By Associate Professor Frazer: Colloidal Chemistry.

XV. *Lectures by Advanced Students.* To each of the more mature students, there is assigned for historical investigation some important topic in chemistry. The results of his investigations are incorporated in a lecture which he gives before the teaching staff and the students. Twenty-one such lectures have been given during the past academic year.

RESEARCH

During the past year a great variety of problems have been under investigation by the teaching staff and the advanced students who were associated with them.

Professor Morse, working under grants from the Carnegie Institution of Washington, has had associated with him Associate Professor Frazer, Associate Holland, and Messrs. Blocher, Coolidge, Minter, Musselman, and Myrick.

The problems which were investigated are:

1. The structure of cells for the measurement of osmotic pressure. (Dr. Holland.)
2. The osmotic pressure of cane sugar at high temperatures. (Dr. Holland and Messrs. Blocher and Musselman.)
3. The osmotic pressure of glucose. (Dr. Holland and Messrs. Musselman and Minter.)
4. The osmotic pressure of mannite. (Professor Frazer.)
5. The osmotic pressure of glucose at low temperatures. (Professor Frazer and Mr. Coolidge.)
6. The osmotic pressure of fructose. (Professor Frazer and Mr. Myrick.)

Professor H. C. Jones has had associated with him in research Dr. P. B. Davis and Dr. E. J. Shaeffer working under a grant from the Carnegie Institution of Washington, and Messrs. Connolly, J. E. L. Holmes, Hutchinson, Lieberknecht, Lloyd, McCall, Ordeman, Paulus, Putnam, Watkins, and Wiesel.

The problems that have been investigated are:

1. A study of the physical chemistry of formamid. (Drs. Davis and Putnam.)

2. The viscosity of binary mixtures of water, formic and acetic acids. (Dr. Davis.)
3. The effect of caesium salts on the viscosity of various solvents. (Dr. Davis.)
4. The constants of indicators as determined radiometrically. (Dr. Shaeffer and Mr. Paulus.)
5. The constants of coralline as determined by means of the radiomicrometer. (Messrs. Paulus and Hutchinson.)
6. The constants of methyl red as determined by means of the radiomicrometer. (Messrs. Paulus and Hutchinson.)
7. The conductivities of the organic acids in ethyl alcohol. (Messrs. Lloyd and Wiesel.)
8. The different chemical behavior of free and combined water, as shown by the saponification of esters. (Mr. J. E. L. Holmes.)
9. The conductivities and dissociations of certain uncommon salts in water. (Mr. Watkins.)
10. The different chemical action of free and combined water, as illustrated by the hydration of acetic anhydride. (Mr. Connolly.)
11. The different dissociating powers of free and combined water. (Mr. Ordeman.)
12. The adsorption of certain substances by soils. (Mr. McCall, with the cooperation of Messrs. F. M. Hildebrandt, F. S. Holmes, Johnston, and Trelease.)
13. A technical problem. (Mr. Lieberknecht.)

Associate Professors Frazer and Lovelace have had associated with them in their investigations on the vapor pressure of solutions Messrs. Miller and Mullikin.

The problems which were studied are:

1. The vapor pressure of aqueous solutions of mannite. (Mr. Mullikin.)
2. The vapor pressure of aqueous solutions of potassium chloride. (Mr. Miller.)

Associate Professor Reid has had associated with him, in his research work, Messrs. Kimball, Markel, Pratt, Rather, Sachs, Van Epps, and Wroth.

The problems which they have studied are:

1. The esterification of acids by various primary mercaptans. (Mr. Pratt.)
2. The esterification of acids by isomeric mercaptans. (Mr. Kimball.)
3. The esterification of isomeric acids by mercaptans. (Mr. Sachs.)
4. Relative solubilities of alcohols in water. (Mr. Wroth.)
5. Quantitative study of the catalytic reduction of gases. (Mr. Rather.)
7. Formation of nitriles. (Mr. Van Epps.)
8. Ester transformations. (Mr. Markel.)

PUBLICATIONS

The publications here mentioned relate principally, of course, to work which was completed during the academic year 1913-1914; the work of 1914-1915 will be published during the year 1915-1916.

H. N. Morse.

The Osmotic Pressure of Aqueous Solutions: A Report on Investigations Made in the Chemical Laboratory of the Johns Hopkins University during the years 1899-1913. Publication 198 of the Carnegie Institution of Washington. In this Monograph an account of the whole investigation is given up to June, 1914.

Harry C. Jones; with P. B. Davis, A. Holmes, H. Hughes, M. G. Paulus, W. S. Putnam, E. J. Shaeffer, L. D. Smith, J. B. Wiesel, and E. P. Wightman.

The Absorption Spectra of Solutions as Studied by Means of the Radiomicrometer.

The Conductivities, Dissociations and Viscosities of Solutions of Aqueous, Nonaqueous, and Mixed Solvents. Carnegie Institution of Washington, *Publication* No. 210.

Harry C. Jones.

Discussion of Evidence Bearing on the Solvate Theory of Solution obtained in the Laboratories of the Johns Hopkins University. Reprint of Chapter vii, *Publication* No. 210, Carnegie Institution of Washington.

Harry C. Jones.

Absorptionspektren und die Solvattheorie der Lösungen. *Zeitschrift für Elektrochemie*, 1914, p. 552.

Harry C. Jones, with E. P. Wightman and J. B. Wiesel.

A Preliminary Study of the Conductivities of Certain Organic Acids in Absolute Ethyl Alcohol at 15°, 25°, and 35°. *Journal American Chemical Society*, 36, 2243 (1914).

Harry C. Jones, with P. B. Davis.

The Viscosities of Binary Mixtures of the Associated Liquids, Water, Formic Acid and Acetic Acid. *Journal American Chemical Society*, 37, 1194 (1915).

Harry C. Jones, with P. B. Davis and W. S. Putnam.

The Conductivities and Viscosities of Certain Rubidium and Ammonium Salts in Ternary Mixtures of Glycerol, Acetone and Water at 15°, 25°, and 35°. *Zeitschrift für Physikalische Chemie*, 1915.

Harry C. Jones, with E. J. Shaeffer and M. G. Paulus.

Radiometric Measurements of the Ionization Constants of Indicators. *Journal American Chemical Society*, 36, 2243 (1914).

Harry C. Jones, with E. J. Shaeffer and M. G. Paulus.

The Absorption Spectra of Aqueous Solutions of Hydrated and Nonhydrated Salts as Studied by Means of the Radiomicrometer. *Zeitschrift für Physikalische Chemie*, 1915.

Harry C. Jones, with M. G. Paulus and J. F. Hutchinson.

Radiometric Determination of the Ionization Constants of Coral-
lin. *Journal American Chemical Society*, July, 1915.

J. C. W. Frazer and B. F. Lovelace.

Studies of the Vapor Pressure of Solutions. A Static Method for
the Determination of the Difference between the Vapor Pressure
of Solution and that of Solvent. *Journal of the American
Society*, vol. 36, p. 2439.

Studien Ueber den Dampfdruck von Loesungen. Eine Statische
Methode zur Bestimmung des Unterschieds Zwischen dem Dampf-
druck der Loesung und des Loesungsmittel. *Zeitschrift für
physikalische Chemie*, lxxxix, p. 155.

A Study of the Vapor Tension of Aqueous Solutions of Potassium
Chloride. *Journal of the American Chemical Society*, August,
1915.

J. C. W. Frazer.

Chapter on "Fuels" in *Manual of Industrial Chemistry*, by Rogers
and Aubert, Second Edition, 1915.

E. E. Reid.

Studies in Esterification (No. 6): The Esterification of Benzoic
Acid by Methyl, Ethyl, Propyl, Isobutyl, and Isoamyl Mercap-
tans (with L. S. Pratt). *Journal of the American Chemical
Society*, July, 1915.

P. B. Davis.

A Substitute for the Twin-Bulb Trap in Toluene-Mercury Thermo-
regulators. *Journal of the American Chemical Society*, vol. 37,
p. 1198.

P. B. Davis and L. S. Pratt.

A New Form of Pycnometer for Liquids. *Journal of the American
Chemical Society*, vol. 37, p. 1199.

STUDENTS

The number of students working in the chemical laboratory, during
both the first and second half of the year, was 142. Of these 52
were graduates, of whom 36 were following chemistry as their prin-
cipal subject.

Eleven students were promoted to the degree of Doctor of Philoso-
phy. Their names and the titles of their dissertations are given
below:

W. H. Coolidge.

Osmotic Pressure Measurements of Glucose Solutions at 10° and
20°.

J. E. L. Holmes.

The Difference in Chemical Behavior of Free and Combined Water
as Illustrated by the Saponification of Esters.

M. B. Hopkins.

The Chlorides of Orthosulphobenzoic Acid.

H. H. Lloyd.

A Study of the Conductivity of Certain Organic Acids in Absolute Ethyl Alcohol at 15°, 25°, and 35°.

E. Miller.

A Study of the Vapor-Pressure of Aqueous Solutions of Potassium Chloride by an Improved Static Method.

R. N. Mullikin.

A Study of the Vapor-Pressure of Aqueous Solutions of Mannites by an Improved Static Method.

A. S. Musselman.

Osmotic Pressure Measurements of Glucose Solutions at 20°, 40°, 50°, and 60°.

M. G. Paulus.

Radiometric Measurements of the Ionization Constants of Methyl Orange and Phenolphthalein.

W. S. Putnam.

I. The Conductivity and Viscosity of Certain Rubidium and Ammonium Salts in Ternary Mixtures of Glycerol, Acetone, and Water at 15°, 25°, and 35°.

II. The Conductivity and Viscosity of Solutions of Binary and Ternary Salts in Formamid.

L. S. Pratt.

The Esterification of Benzoic Acid by Mercaptans.

Charles Watkins.

The Conductivity, Dissociation and Temperature Coefficients of Conductivity of Some Rather Uncommon Salts in Aqueous Solution.

Mr. R. T. Myrick was appointed University Fellow for the year 1915-1916.

THE ILSE SCHMIDT FELLOWSHIP

Mr. Charles R. Schmidt, the well-known mechanical engineer, has generously donated the sum of five hundred dollars with which to found a Fellowship in Chemistry for the academic year 1915-1916. Mr. Schmidt has requested that the Fellowship be named, after his deceased daughter, "The Ilse Schmidt Fellowship." The Fellowship has been awarded to Mr. George Frederick Ordeman, of Frederick, Maryland.

HARMON N. MORSE,

Director of the Chemical Laboratory.

GEOLOGY

The Geological Laboratory was open daily throughout the year for graduate and undergraduate students. Lectures and classroom work were conducted as follows:

(a) Geology I: Physiography, Dynamical and Historical Geology, by Professor Swartz. *Three lectures and one afternoon of practical work each week throughout the year.*

(b) Geology II: Mineralogy and Elementary Petrography, by Professor Swartz. *Three lectures and two afternoons of practical work throughout the year.*

(c) Geology III: Applied Geology, by Professor Mathews. *Three lectures each week throughout the year.*

(d) Principles of Geology, by Professor Clark. *One lecture each week throughout the year.*

(e) Advanced Historical Geology, by Professor Clark. *One lecture each week throughout the year.*

(f) Exploratory and Geological Surveying, by Professor Reid. *Two lectures each week throughout the year.*

(g) Advanced Mineralogy, by Professor Mathews. *Three lectures and two afternoons of laboratory work throughout the year.*

(h) Geological Field Methods, by Professor Mathews. *During spring and fall according to special appointment.*

(i) Paleontology, by Professor Berry, assisted by Dr. Gardner. *Two lectures and two afternoons of laboratory work throughout the year.*

(j) Advanced Paleontology, by Professor Berry. *One afternoon each week throughout the year.*

(k) Ore Deposits, by Dr. Singewald. *Two lectures each week throughout the year.*

(l) Climatology, by Dr. Fassig. *Ten lectures during February, March and April* and conferences with selected students at local United States Weather Bureau office.

(m) Laboratory Work. The geological laboratory has been open *daily during the year* for the work of advanced students under the direction of Professor Clark, assisted by the other members of the staff.

(n) Geological Conferences, by Professor Clark. *Weekly, throughout the year.*

Original Work and Publications. Professor Clark continued his work on various phases of Maryland geology with the aid of several assistants. The results of this work appear from time to time in the current reports of the Maryland Geological Survey and in other scientific publications. He has been actively engaged in the management of the State Geological Survey and the State Weather Service, and in the supervision of the publications of these two bureaus,

both of which are carried on under the auspices of the University. He is also a member of the State Board of Forestry and its Executive Officer. Professor Clark has also prepared for publication, with the aid of Dr. M. W. Twitchell, a former graduate student of the department, a Memoir on the Mesozoic and Cenozoic Echinodermata of the United States which appears as Monograph 54 of the United States Geological Survey.

Professor Reid has continued his seismological studies. He is the official American representative of the International Seismological Association and is also in charge of the earthquake records of the United States Geological Survey.

Professor Mathews spent the field season of 1914 in studying the eruptive rocks of Scandinavia. In connection with the Maryland Geological Survey, Dr. Mathews, as Assistant State Geologist, has had charge of certain phases of the work and of the editing of various publications of the bureau. He has been occupied during the year in compiling a map of Baltimore and vicinity on the scale of 1,000 feet to the inch, three sheets of which have been published and a fourth is in press. He has nearly completed a similar map of Cumberland and vicinity.

Professor Swartz has continued his work upon the Carboniferous formations of Western Maryland and adjacent parts of Pennsylvania. He has also been engaged in a monographic study of the Upper Silurian of Maryland.

Professor Berry has continued his studies of the extinct floras of the Atlantic Coastal Plain. A large work devoted to the Lower Eocene Floras of Southeastern North America is now going through the press as Professional Paper No. 91 of the United States Geological Survey. Professor Berry has also prepared for publication a monograph on the Upper Cretaceous floras of Maryland for the State Geological Survey and a similar work covering the North Carolina area for the Geological Survey of the latter State. The work of indexing the literature of paleobotany has also made such additional progress during the year as time permitted.

Dr. Singewald has continued his study of the siliceous hematite ores of Alabama to determine the possibility of utilizing these ores through the elimination of silica by subjecting them to concentration.

Dr. Gardner has been engaged during the year in monographing the prolific invertebrate faunas of the Miocene and Pliocene formations of North Carolina and Virginia. This work has been in progress now for over five years and is rapidly approaching completion. A study of the Upper Cretaceous faunas of Maryland was completed during the year and is now in press.

Messrs. R. M. Overbeck and W. P. Woodring were appointed Fellows and Mr. J. B. Reeside, Jr., Fellow by Courtesy.

Apparatus and Collections. Several valuable additions have been made to the apparatus and collections during the year. A large number of rare books have been purchased and the department now has one of the most complete geological libraries in this country. The library has been considerably enlarged by gifts of books and

maps. Professor Cleveland Abbe, in particular, has added many books to the meteorological library which bears his name.

Recommendations.—Provision should be made for more work in physiography than we have had in the past, since this subject is receiving a larger amount of attention at many of the other important institutions. A comprehensive physiographic course either by a resident instructor or by some one introduced for two or three months of the year would greatly strengthen our work.

A larger instrumental equipment is needed especially in seismological apparatus. We have none of the more recent instruments in this line, although much seismological investigation has been conducted in the laboratory by Professor Reid, who for many years has been the official representative of the United States Government on the International Seismological Commission. There is also need of a number of new petrographical microscopes and other optical apparatus.

After removal to Homewood adequate exhibition cases should be provided for the halls and large lecture room so that the public may get a better idea of the interesting materials in our custody, especially from the State of Maryland. Such an exhibition would be of much educational value.

PUBLICATIONS

Clark, Wm. Bullock.

The Mesozoic and Cenozoic Echinodermata of the United States. *Monogr. U. S. Geol. Survey*, vol. liv, 341 pp., 108 pls., 1915.

Johns Hopkins in Account with Amherst. *Amherst Graduates' Quarterly*, No. 15, pp. 215-217, April, 1915.

Reid, Harry Fielding.

The Lisbon Earthquake of November 1, 1755. *Bull. Seis. Soc. Amer.*, vol. iv, pp. 53-80, 1914.

The Free and Forced Vibrations of a Suspended Magnet. *Terrest. Magn. and Atmos. Elect.*, vol. xix, pp. 57-72, 189-203, 1914.

The Influence of Earthquake on Suspended Magnets. *Bull. Seis. Soc. Amer.*, vol. iv, pp. 204-214, 1914.

Earthquakes and Volcanoes in "The American Year Book for 1914," pp. 596-598. Appletons, New York, 1915.

Mathews, E. B.

The University and the State Bureaus. *J. H. U. Alumni Mag.*, vol. iii, pp. 102-114, 1915.

Map of Baltimore and Vicinity, Southwest sheet. *Md. Geol. Survey*, 1915.

Berry, Edward W.

Two New Tertiary Species of Trapa. *Torrey*, vol. xiv, pp. 105-108, 1914.

The Affinities and Distribution of the Lower Eocene Floras of Southeastern North America. *Proc. Amer. Phil. Soc.*, vol. liii, pp. 129-250, 1914.

Additions to the Pleistocene Flora of Southern States. *Torrey*, vol. xiv, pp. 159-162, 1914.

- Notes on the Geological History of the Walnuts and Hickories. *Smithsonian Rept. for 1913*, pp. 319-331, Dec., 1914.
- The Mississippi River Bluffs at Columbus and Hickman, Kentucky, and their Fossil Flora. *Proc. U. S. Nat'l Museum*, vol. xlix, pp. 293-303, pls. 12, 13, 1915.
- An Eocene Ancestor of the Zapodilla. *Amer. Jour. Sci.*, (iv), vol. xxxix, pp. 208-213, pl. 1, 1915.
- A Species of *Copaifera* from the Texas Eocene. *Torrey*, vol. xv, pp. 41-44, 1915.
- Scientific Results of the Terra Nova Expedition. *Science*, vol. xli, No. 1065, 1915.
- The Age of the Leaf-bearing Cretaceous of Southern New York and New England. *Jour. of Geol.*, vol. xxiii, No. 3, 1915.
- Gardner, Julia A.
- Relations of the Late Tertiary Faunas of the Yorktown and Duplin Formations. *Amer. Jour. Sci.* (iv), vol. xxxix, pp. 305-310.

WM. BULLOCK CLARK,
Director of the Geological Laboratory.

ZOOLOGY, BOTANY, PLANT PHYSIOLOGY

I. ZOOLOGY

Certain phases of the investigations on heredity and variation under uniparental reproduction, carried on in the Zoological Laboratory, have been brought to conclusion. Papers by K. S. Lashley, A. R. Middleton, and Ruth J. Stocking on these researches are now in press. Owing to the large quantity of data collected, the preparation of the manuscript on Professor Jennings' investigation of these matters in *Diffugia* will require considerable time. Researches in this field, not yet finished, have been carried on also by F. M. Root and E. P. Churchill. Mr. Root has also made a study of certain problems of linkage in the silkworm; and Professor Jennings has made an investigation of the theoretical result of long-continued breeding by various systems.

Professor Andrews continued investigations of the life history of certain marine organisms.

Professor Grave examined the development of certain Ascidians, with special attention to the cytological processes and to the origin of the reproductive cells.

Professor Mast continued his investigations on the behavior of animals. Mr. H. S. Willis studied under his direction the feeding and behavior of *Amoeba*.

Professor Andrews, Dr. K. S. Lashley, and Dr. A. R. Middleton remain for the summer in Baltimore, continuing in the Zoological laboratory their researches. Professor S. O. Mast spends the summer in researches on the reactions of organisms to light, at the Nela

Research Laboratory at Cleveland, Ohio. Dr. Ruth J. Stocking and Mr. F. M. Root occupy for the summer the two investigators' tables maintained by the University in the Marine Biological Laboratory at Woods Hole, Mass. Mr. E. P. Churchill continues for the United States Bureau of Fisheries his researches on the nutritive processes in fresh water mussels, begun last summer; he is stationed at the Bureau's laboratory at Freeport, Iowa.

Lectures and classroom work have been conducted as follows:

BIOLOGICAL JOURNAL CLUB

The instructors and students in Zoology joined with those in Botany and Plant Physiology in a weekly club for the presentation and discussion of reviews of recent literature in these three fields.

ZOOLOGICAL SEMINARY

The Seminary is a club of persons interested in general and philosophical aspects of biology. It included the instructors and graduate students in Zoology, together with a number of persons from other departments, or from outside the University. The Seminary met weekly throughout the year; it read and discussed McDougall's *Body and Mind*.

Professor Jennings conducted the following courses:

Genetics. *Three lectures weekly, from October 1 to February 15; once a week for the remainder of the year.*

Investigations in Experimental Zoology. *Daily throughout the year.*

Professor Andrews conducted the following:

General Biology. *Nine hours weekly, October 1 to March 15.*

Embryology. *Nine hours weekly from March 15 to the end of the session.*

Associate Professor Grave conducted the following:

Comparative Anatomy of Vertebrates, Cytology and Embryology. *Nine hours weekly throughout the year.*

Natural History. *Nine hours weekly, from February 1 to the end of the session.*

Associate Professor Mast conducted courses as follows:

General Physiology and Animal Behavior. *Nine hours weekly throughout the year.*

Problems in Behavior of Animals. *Hours as required.*

Professor Grave continues his work during the summer in charge of the course in Invertebrate Zoology at the Marine Biological Laboratory at Woods Hole, Mass.

E. P. Churchill, H. S. Willis, and Mary Gover were student assistants in Zoology for the year.

The requirements for the doctor's degree were absolved during the year by Austin R. Middleton and Ruth J. Stocking.

Francis M. Root has been appointed Adam T. Bruce Fellow for the coming year. E. P. Churchill has been appointed University Fellow in Zoology.

PUBLICATIONS IN ZOOLOGY

Churchill, E. P.

The Absorption of Fat by Fresh Water Mussels. *Biological Bulletin*. In press.

Grave, Caswell.

Ophiura brevispina II. A study of the effect of yolk substance upon development and developmental processes. *Journal of Morphology*. In press.

Jennings, H. S.

Life and Matter, from the Standpoint of Radically Experimental Analysis. *Johns Hopkins University Circular*, 1914. 20 pp.

Development and Inheritance in Relation to the Constitution of the Germ. *Johns Hopkins University Circular*, 1914. 52 pp.

Table for Computing the Results of the Distribution of Chromosomes, and the Inheritance of Mendelian Factors, in Biparental Reproduction. *Johns Hopkins University Circular*, 1914. 5 pp.

Lashley, K. S.

Inheritance in the Asexual Reproduction of *Hydra viridis*. Abstract. *Proceedings of the National Academy of Science*, Vol. 1, pp. 298-301.

Inheritance in the Asexual Reproduction of *Hydra viridis*. *Journal of Experimental Zoology*. In press.

Mast, S. O.

Vision in Flounders. Abstract. *Science*, Vol. 41, pp. 470.

Colton and Murbach, Briefer Physiology and Hygiene. Review. *School Science*, Vol. 15, pp. 270-271.

Changes in Shade, Color, and Pattern in Fishes and Their Bearing on Certain Problems of Behavior and Adaptation. *Proceedings of the National Academy of Sciences*, Vol. 1, 1915, pp. 214-219.

What are Tropisms? *Arch. f. Entw. Mech.*, Bd. 41, 1915, pp. 252-263.

Orientation in *Euglena*, with Some Remarks on Tropisms. *Biol. Centralblatt*, Bd. 34, pp. 641-674.

Changes in Shade, Color, and Pattern in Fishes and Their Bearing on the Problems of Adaptation and Behavior, with especial Reference to the Flounders *Paralichthys* and *Ancyllopsetta*. *Bulletin of the U. S. Bureau of Fisheries*. In press.

The behavior of *Fundulus* with especial reference to locomotion on land. *Journ. Animal Behavior*. In press.

Middleton, A. R.

Heritable Variations and the Results of Selection in the Fission Rate of *Stylonychia pustulata*. *Journal of Experimental Zoology*. In press.

Stocking, Ruth J.

Inheritance and Variation in Abnormalities Resulting from Conjugation in *Paramecium caudatum*. *Journal of Experimental Zoology*. In press.

Needs of the Department of Zoology.—It may be appropriate to point out here the most pressing needs for the proper development of the work in Zoology. Our chief needs are such as would naturally be supplied in the construction of a laboratory adapted to our work, in a proper environment, such as we should have at Homewood. Certain specific needs are so pressing that they should be met so far as possible even if the laboratory cannot at present be built. These are the following:

(1) The greatest need is for proper facilities for the study of living organisms under normal conditions; their physiology, behavior, development, breeding, and evolution. For these purposes small greenhouses, or rooms of greenhouse construction, with numerous basins and tanks of cement, are what is needed; together with a number of outdoor tanks and ponds. In this way the efficiency of our work, both in research and in instruction, could be very greatly increased; and the expense would be relatively slight.

(2) Other pressing needs are better conditions for the precise control of temperature and of light, in biological work. Control of the temperature is fundamental for much of the work on living organisms; and precise work on the relations of animals to light forms, under the direction of Professor Mast, one of our chief lines of research. It will not be easy to supply these needs satisfactorily otherwise than in the construction of a new laboratory, for which constant temperature rooms and properly equipped dark rooms can be planned.

(3) We need also rooms for the care and breeding of larger animals (rabbits, guinea pigs, etc.). These can probably be best arranged for in connection with the plans of the Psychological Department for an animal house.

II. BOTANY

Lectures and laboratory work have been conducted as follows:

By Professor Johnson.

The structure of Root, Stem and Leaf. Lectures and laboratory work. *Seven hours a week from October 1 to Christmas. Ten hours a week from January to April. Six field trips on Saturdays.*

The Physiological Anatomy of Plants. Lectures, laboratory work and conferences. *Four hours a week, November until Christmas. Eight hours a week, January to April.*

Botanical Seminary. (The Relationship and Distribution of Seed Plants). *One hour a week, November and December. Two hours a week, January to April.*

Laboratory Instruction and Direction of Research. *Daily, October to April.*

ADVANCED WORK

Professor Johnson during July, August, and September, 1914, continued, at the Harpswell Laboratory, his investigation and description of the development and germination of the fruits of the *Cactaceae*. Manuscripts of papers on other topics were also prepared

for publication. During April, May, and June, 1915, while on leave of absence from this University, he studied in the field the persistence and proliferation of attached fruits in the cacti of Arizona, at the Desert Laboratory of the Carnegie Institution of Washington.

Grace A. Dunn spent July, 1914, at the Harpswell Laboratory engaged in the preparation and study of material for her investigation of the red seaweed, *Dumontia filiformis*. This plant, which has long been known in Europe, was discovered for the first time in North America by Miss Dunn. Her investigation in the Botanical Laboratory of the development and cytology of this alga has yielded important results and cleared up many steps in its complicated and interesting life history. Miss Dunn's paper embodying the results of this research was accepted as a dissertation for the degree of Doctor of Philosophy, in June, 1915, at which time she absolved the requirements for the degree.

Dr. W. D. Hoyt, Fellow by Courtesy, continued work on the manuscript of his report to the U. S. Fish Commissioner on the distribution of the marine algae of Beaufort, N. C.

BOTANICAL GARDEN

Seeds and young plants needed for the Garden and in the Laboratories have been received from the Missouri Botanical Garden, the New York Botanical Garden, the United States Department of Agriculture, and the Carnegie Institution of Washington.

During the year a new type of label has been devised for the native trees, which not only gives the name and relationship of the tree, but also indicates its geographical distribution on a printed map. The label is water-proof and readily legible, but of a gray color that makes it barely discernible a few dozen yards from the tree.

The ground adjoining the Garden on the west and north has been cleared of brush. The shores of the pond at the north have been planted, and a small nursery of shrubs and trees has been established. These plants will be ready for use in the general planting of the grounds at Homewood when these are graded.

The number of daily visitors at the Garden increases steadily. On one Sunday of 1915, between 10 a. m. and 5 p. m., 272 people visited it. A considerable number of classes from the colleges and schools of Baltimore visit the Garden, under guidance, each year.

PUBLICATIONS IN BOTANY

D. S. Johnson.

The Structure and Seed Development of *Peperomia hispidula* (Part II). *American Journal of Botany*, vol. 1, 357-397, October, 1914.

Sexuality in Plants. *Journal of Heredity*, vol. 6, 3-15, January, 1915.

The History of the Discovery of Sexuality in Plants. Address of Vice-President and Chairman of Section G, Botany, American Association for the Advancement of Science, December, 1913.

(Reprinted by permission of the author from *Science*, vol. 27, 1914.) *Report of the Board of Regents of the Smithsonian Institution*, 1914, 383-406.

Review of Shreve's "A Montane Rain Forest." *Science*, vol. 40, 897-898, December 18, 1914.

The Cinchona Botanical Station. *Popular Science Monthly*, vol. 85, December, 1914, 521-540, and vol. 86, January, 1915, 34-48.

F. Shreve.

A Montane Rain Forest: A Contribution to the Physiological Plant Geography of Jamaica. Carnegie Institution of Washington, Publication 199. (A considerable share of this investigation was carried out during an eight months' stay in Jamaica while Dr. Shreve held the Adam T. Bruce Fellowship of the Johns Hopkins University.)

W. H. Brown.

The Development of *Pyronema confluens* var. *igneum*. *American Journal of Botany*, vol. 2, 289-298, 1915. (Embodying the results of an investigation carried on in the Botanical Laboratory in 1906.)

Needs of the Botanical Department.—One of the most important needs for expanding the botanical work of the University is means for providing for instruction and research in plant pathology. If this work could be established on a real university basis now, it would make Johns Hopkins a pioneer in the advanced training of workers such as are urgently needed by the national Department of Agriculture and by every state experiment station. The provision of real university training for investigators in this field could not fail to prove of the very highest importance to the practical agriculturist.

Another persistent need would be met by providing for a course in bacteriology for academic students. Each year several, or sometimes many, students apply for such a course.

The need of a new biological laboratory at Homewood will increase rather than diminish after the proposed move to the temporary quarters in the Academic Building next year.

III. PLANT PHYSIOLOGY

ADVANCED WORK

Studies on the water-relations of plants have been continued throughout the year, with financial aid from the Department of Botanical Research of the Carnegie Institution of Washington. During the summer of 1914 Professor Livingston was assisted in these studies, at Tucson, by Mr. H. C. Sampson, of the School of Education of the University of Chicago, who carried out an extensive experimental investigation of the relation of evaporation rate, per superficial unit, to the size, shape, exposure, etc., of the evaporating surface.

The preparation and standardization of cylindrical porous clay cups for the porous cup atmometer (for measuring evaporation) has been continued throughout the year by Miss Aleita Hopping and Mr. E. S.

Johnston, working with the direction of Professor Livingston. These cups are employed by workers in plant physiology, plant ecology, agriculture, forestry, entomology, climatology, etc., where evaporation conditions require comparative measurement, and more than a thousand have been furnished to investigators during the year.

As reported a year ago, white spherical porous cups are now obtainable in the United States, and Mr. E. S. Johnston has devoted considerable time to the perfecting of methods for preparing and standardizing these. They are rapidly coming into use to replace the old cylindrical cup.

Mr. John W. Shive devised an improved form of mounting for the porous cup atmometer, which prevents rain absorption and is self-contained, and many research workers throughout the country are now making use of this mounting.

A modification of Bellani's (1820) porous plate for atmometric measurements has been devised and procured by Professor Livingston, a circular disk of white, porous porcelain, mounted across the large end of a glazed porcelain funnel. This arrangement furnishes a plane evaporating surface similar to that of free water and avoids most of the difficulties of operation met with when open pans are employed.

The radio-atmometer, consisting of a black and white spherical cup operated side by side, is slowly approaching perfection; great difficulty has been encountered in obtaining the requisite black porous spheres. On account of the uncertain commercial relations with Germany that have prevailed throughout the year, experiments in that country have been largely discontinued and manufacturers in the United States have been encouraged to attempt these difficult pieces. A few satisfactory black spheres have been obtained, with which Mr. Johnston and Professor Livingston have carried out a study of the behavior of the instrument in various respects. This work will continue. It appears practically assured that the radio-atmometer will furnish a valuable simple instrument for the approximate integration of sunlight intensity for the purposes of plant physiologists, agriculturists, foresters, etc.

Mr. A. L. Bakke, of Iowa State College, worked on plant water relations with Professor Livingston, during the summer of 1914, at Tucson, making a study of the alteration in foliar transpiring power occurring as the plant progressively wilts, by means of cobalt-chloride paper. As wilting proceeds the index of transpiring power decreases regularly to a low value, and then suddenly increases very definitely, after which a second period of decrease finally terminates with an index value approaching zero when the leaves have become dry.

Miss Aleita Hopping and Mr. E. S. Johnston have made marked progress in the perfecting of various details of the method of cobalt-chloride paper for the study of the foliar transpiring power of plants, especially with reference to preparation of the paper and to the relation of its coefficient to temperature.

Mr. S. F. Trelease has carried out a study of the daily march of the foliar transpiring power of plants of Wandering Jew (*Zebrina*)

growing in the experiment houses of the Laboratory of Plant Physiology, using the method of standardized cobalt-chloride paper and comparing the results thus obtained with those furnished by F. Darwin's porometer. The two methods agree in general, but the porometer readings (supposed to represent stomatal diffusive capacity alone) show a somewhat larger daily range of value than that exhibited by the transpiring power measured with hygrometric paper.

The auto-irrigator, for the automatic maintenance of a practically constant moisture-content in pots of soil with growing plants, has been considerably improved in the details of its arrangements by Mr. F. T. McLean and Professor Livingston. Porous clay cylinders for this instrument are now obtainable in a large size, for use in large soil containers and in the auto-irrigation of boxes, etc., as in greenhouse cultures.

Mr. E. E. Free has made a preliminary study of the relation of the oxygen content of the soil to the growth of the foliage plant (*Coleus*). This plant appears to require a very small amount of oxygen in the soil about its roots; without any oxygen in the soil the water-absorbing power of the roots seems to be practically destroyed, but only a very low oxygen pressure is apparently required for good growth. This work will be continued.

A quantitative study of flocculation in suspensions of very finely divided solids has been made by Mr. Free, working in collaboration with the U. S. Bureau of Soils, the work being done at the Laboratory of Plant Physiology. This problem deals with some of the fundamental conceptions underlying our appreciation of the physical relations obtaining between plant and soil.

Mr. A. G. McCall (on leave of absence from Ohio State University) investigated the water-supplying power of the soil by means of vacuum porous clay tubes and plates, acting somewhat as plant roots. This method of approach was suggested by the work of Briggs and McCall in 1904 (*Science*, n. s. 20: 566-9).

The salt-nutrition of plants and various problems of ion-antagonism have been studied along several lines during the year. Mr. J. W. Shive completed his investigation of the possibility of a three-salt nutrient solution for plants and discovered not only that such a solution is possible, but that it produces better growth of wheat and buckwheat than do the four-salt or five-salt solutions usually employed in salt-nutrition studies. The results obtained include valuable additions to our knowledge of the relations holding between salt-proportions and total osmotic concentration in nutrient media, and throw light upon the general problem of physiological salt-balance and ion-antagonism.

Mr. F. M. Hildebrandt has entered upon an experimental investigation of the effects produced, upon growing wheat plants, by the complete absence of any one of the seven ions usually regarded as requisite for plant growth, and Mr. A. G. McCall has begun a study of the behavior of wheat growing in sand supplied with the various three-salt nutrient solutions of Mr. Shive's series.

Several studies directed toward a quantitative interpretation of climatological data, so as to begin to throw light upon the relation

of climatic conditions to plant growth, have made progress during the year. Mr. F. T. McLean completed the instrumental and observational work for a preliminary study of the relation of climate to plant development in Maryland, nine stations being employed. He elaborated the large number of data thus obtained for two of these stations, Easton (on the coastal plain) and Oakland (near the crest of the Alleghany mountains). The results involve several seemingly important advances in connection with the relations between temperature and moisture conditions, on the one hand, and plant growth, on the other. As has been previously announced, this work is being carried on under the auspices of the Maryland State Weather Service.

Professor Livingston has devised a new method for integrating climatic temperature data, based on the relation of plant growth to temperature, as experimentally determined. A temperature efficiency chart for the period of the average frostless season in the United States has been constructed upon this basis.

The physiological temperature efficiency indices just mentioned rendered it possible, for the first time, to bring together the temperature and moisture conditions for any given season at any given locality, so as to furnish a single index of climatic efficiency for plant growth. This is the product of the summation of the daily temperature efficiency indices and the ratio of precipitation to evaporation for the period in question. It is but a tentative index at present, but appears to embrace the main climatic conditions as these influence plant growth in general.

Miss Aleita Hopping has completed an English translation of Paladin's *Pflanzenphysiologie*.

THE LABORATORY OF PLANT PHYSIOLOGY

The equipment for experimental work at the Laboratory of Plant Physiology has been improved in various ways during the year, mainly by the purchase or construction of apparatus required by the various researches that have been in progress. The large number of research workers has taxed the facilities nearly to their utmost, so that the physical limit to the number of graduate students for this department has been practically attained.

Mr. J. W. Shive had charge of the equipment during the year, and Professor Livingston has been assisted in other ways by Miss Aleita Hopping, Mr. E. S. Johnston and Mr. E. E. Free.

The needs of the Laboratory of Plant Physiology, for the near future, may receive brief attention here. To render the present building as highly efficient as possible, the annual appropriation should be increased to a comparatively slight degree, but the physical limit set by the size of the building itself is now the main obstacle retarding increase in the volume and importance of this work. Two kinds of additional laboratory space are needed, ordinary rooms in which the workers may have their tables, and experiment chambers with equipment for the control of environmental conditions. These latter should be basement rooms, and they may be conveniently placed underneath the present experiment greenhouse. They should be equipped with apparatus for the control of temperature and moisture conditions and for the supply of artificial light of various intensities

and qualities. No laboratory has thus far been so equipped, although practically all fields of plant physiology require such facilities and this need has long been appreciated. It thus appears that the next step to be taken in the direction of facilities for increased work here should be the completion of the range of buildings at the north side of the Botanical Garden, and the putting of a basement under the present experiment greenhouse. Such an addition would allow for at least three or four more students and would open the field for the first experimentation upon green plants under really controlled environmental conditions. The fundamental importance of such work, to agriculture and forestry as well as to scientific physiology as such, cannot be overestimated.

One of the greatest needs in modern science is arrangements facilitating reference to a voluminous and scattered literature, and this need is specially pronounced in physiology, since its literature should include virtually all of the literature of chemistry and physics, as well as much of that of botany, zoology, meteorology, climatology, geology, etc. When competent assistance can be secured it is highly desirable that a continuous annotated bibliography of plant physiology be inaugurated here. This should be in card form, and its value would soon become very great, so as to attract users from other places as well as from this laboratory. Facilities for research (and thus for training in research) and facilities for ready reference to the literature of research should be built up side by side.

Looking farther into the future, as opportunity may offer, certain lines of physiological work should be taken up specially, a general course for students being given in each line. Of these special lines, soil physics and chemistry, soil bacteriology, and the physiological chemistry of plants are the most needed at present. Agricultural climatology (the study of climate with reference to plant growth) and physiological pathology (the dynamic study of plant diseases) should be established as special lines whenever men competent to elaborate these branches may be found.

The suggestions above made are based upon the conviction that the greatest general advance will be accomplished if this University carefully avoids the duplication of lines of work being carried out elsewhere. The innovations that may be made here should aim to fill hiatuses in the science that are not adequately filled in other places.

Outside of the field of plant physiology it appears wise for this University to aim ultimately to have departments or sub-departments in certain other lines that deal with the science underlying agriculture, forestry, etc. Provision is made for a future beginning in forestry as such, and a department of forestry should offer opportunity for specialization in the chemistry and physics of forest products and in the applied science of wood-preservation. Bacteriology and physiological mycology, without special reference to medicine, should be provided at some time, as is true also of entomology, with special reference to agricultural and forestal problems.

PUBLICATIONS IN PLANT PHYSIOLOGY

E. E. Free.

A relative score method of recording comparisons of plant conditions and other unmeasured characters. *Plant World* 18: 249-256. Sept., 1915.

B. E. Livingston.

Atmometry and the porous cup atmometer. *Plant World* 18: 21-30, 51-74, 95-111, 143-149. Jan.-April, 1915.

A modification of the Bellani porous plate atmometer. *Science*, n. s. 41: 872-874. June 11, 1915.

Atmospheric influence on evaporation and its direct measurement. *Monthly Weather Rev.* 43: 126-131. March, 1915.

Influence of humidity and illumination on transpiration. (Review of: F. Darwin, On a method of studying transpiration. *Proc. Roy. Soc. London*, B. 87: 269-80. 1914. The effect of light on the transpiration of leaves. *Ibid.*, B. 87: 281-99. 1914.) *Plant World* 17: 216-219. July, 1914.

Spherical porous cups for atmometry. *Carnegie Inst. Wash. Year Book* 13: 84-85. 1915.

B. E. Livingston and A. L. Bakke.

The transpiring power of plant foliage, as measured by the method of standardized hygrometric paper. *Ibid.* 13: 86-87. 1915.

B. E. Livingston and L. A. Hawkins.

The water-relation between plant and soil. *Carnegie Inst. Wash., Pub.* 204: 1-48. 1915.

B. E. Livingston and Aleita Hopping.

Permanent standardization of cobalt-chloride paper for use in measuring the transpiring power of plant surfaces. *Carnegie Inst. Wash. Year Book* 13: 87. 1915.

H. E. Pulling and B. E. Livingston.

The water-supplying power of the soil as indicated by camometers. *Carnegie Inst. Wash., Pub.* 204: 51-84. 1915.

J. W. Shive.

The freezing-points of Tottingham's nutrient solutions. *Plant World* 17: 345-353. Dec., 1914.

An improved non-absorbing porous cup atmometer. *Ibid.* 18: 7-10. Jan., 1915.

A three-salt nutrient solution for plants. *Amer. Jour. Bot.* 2: 157-160. April, 1915.

S. F. Trelease.

The transpiring power of leaves. (Review of A. L. Bakke, Studies on the transpiring power of plants as indicated by the method of standardized hygrometric paper. *Jour. Ecol.* 2: 145-173. 1914.) *Plant World* 18: 222-221. Aug., 1915.

HERBERT S. JENNINGS,
Henry Walters Professor of Zoology.

DUNCAN S. JOHNSON,
Professor of Botany.

BURTON E. LIVINGSTON,
Professor of Plant Physiology.

ANIMAL PHYSIOLOGY

The regular undergraduate courses in animal physiology have been given during the year, as follows:—

Professor Howell.

Digestion and Nutrition. *Twice weekly, fall trimester.*

Special Senses and Central Nervous System. *Twice weekly, winter trimester.*

Associate Professor Hooker.

Circulation and Respiration. *Twice weekly, spring trimester.*

Associate Professor Snyder.

The Physiology of Muscle and Nerve. *Weekly, winter trimester.*

Professor Howell and Drs. Hooker and Snyder.

Laboratory course in Experimental Physiology. *Fourteen hours weekly, fall and spring trimesters.*

In giving these courses during the present session it was necessary to ask for some help in the form of student assistants, owing to the large amount of personal instruction and demonstration required in laboratory work in animal physiology. Mr. Sosman of the second-year medical class acted as student-assistant during the fall trimester, and Mr. Sosman and Mr. Lynch, the latter a graduate student, served in this capacity during the spring trimester.

JOURNAL CLUB

As in former years a Journal Club was organized under the direction of Professor Howell for the presentation and discussion of current literature in physiology and the allied sciences. The club was composed of the instructors and special students in Physiology, together with some of the instructors in the departments of Pathology and Anatomy. It met weekly.

ADVANCED WORK

Definite investigations have been undertaken during the session by all the members of the staff and by special or advanced students working under their direction. Dr. Minot of the Massachusetts General Hospital and Dr. Denny of the Peter Bent Brigham Hospital, Boston, have spent a large part of the year in the laboratory engaged in experimental work upon the coagulation of blood, with special reference to the occurrence and place of formation of anti-thrombin. Two graduate students in the philosophical faculty, Miss Thurlow and Mr. Lynch have been following investigations, one upon the application of the Barcroft method of determining the percentage saturation of hemoglobin to the study of the condition of acidosis; the other upon the occurrence and cause of muscular contracture. Several medical students have also undertaken special problems under the direction of members of the staff. Mr. Gasser, Mr. Sosman and Mr. Stewart have been working upon the different phases of the problem of coagulation of blood under the direction of

Professor Howell. Mr. Morison and Mr. Mann have been working with Dr. Hooker, the former on the causation of shock, the latter upon the metabolic activity of the spleen when perfused with an artificial circulation. The personal investigative work of members of the staff has been as follows: Professor Howell, upon the coagulation of the blood studied by means of the ultra microscope; Dr. Hooker, upon the conditions of activity of the isolated respiratory center in the mammal; Dr. Snyder upon the problem of heat formation in contracting smooth muscle. Some of these researches will be completed by the end of the session and the results will be published during the summer. Owing to the fact that the last report of work was submitted in October of the present year, most of the publications that have actually appeared from the department during the year have already been referred to.

PUBLICATIONS

Additional publications since this report are as follows:

W. H. Howell.

Premedical studies in their relation to general and professional training. *Memorial of the centennial of the Yale Medical School*, 1915.

D. R. Hooker (with R. A. Morison).

The vascular tone and the distribution of the blood in surgical shock. *American Journal of Physiology*, vol. xxxvii, 1915, pp. 86-94.

C. D. Snyder.

The inversion of respiratory waves in sphygmomanometer records of arterial pressure in man. *American Journal of Physiology*, vol. xxxvi, 1915, pp. 430-440.

A study of the causes of respiratory change of heart-rate. *American Journal of Physiology*, vol. xxxvii, 1915, pp. 104-118.

Recommendations.—In conclusion may I call attention to what I consider the major needs of the laboratory. These needs are four-fold, namely, more space for the practical classes and the individual workers; a special appropriation for apparatus and research; an advance in the scale of salaries for instructors and provision for maintaining skilled technicians as a permanent part of the laboratory service. The demand for more space arises out of the character of the experimental work required of the students. Owing to the size of the classes and the undesirability of multiplying expensive apparatus for students' use we are forced to divide the class into four sub-groups, each assigned to a separate instructor. At present one of these groups occupies part of the large auditorium on the first floor, and one carries on its work in the attic. While this arrangement suffices for our present needs, it is inconvenient, and the wide separation of the groups is undesirable from the standpoint of supervision. The first floor of the Physiological Building is given up largely to the library and offices of administration. If the time ever comes when some benefactor shall provide for the school adequate quarters for the library it is my hope that the physiological department may fall heir to the rooms thus vacated. In this way the needs of the laboratory in this particular will be met satisfactorily.

I may say in passing that one of the most pressing internal needs of the school is a commodious fire-proof building for the library. The present quarters are unsafe, in that they are continually exposed to the dangers of fire, and if we should lose our library the loss would be almost irreparable, owing to the difficulty of replacing our files of journals. Moreover, the present rooms are not well adapted for their purpose since poor facilities are provided for studying, and it has not been thought to be desirable to keep them open in the evening. Opportunities and encouragement for reading are nearly as important in the education of the student and the work of the staff as are opportunities for laboratory experimentation. While we provide amply for the latter, it is obvious that our arrangements for the former are very deficient.

In regard to the need for a special appropriation for apparatus and research, I may call attention to the fact that the appropriation made for the department now with our large classes is the same or indeed somewhat smaller than it was years ago when the number of students was much smaller. The natural result has been that a much larger proportion of this appropriation is expended in meeting the demands for class instruction. In order to keep within the annual appropriation rigid economy is required, and the stringency has been felt especially on the side of the research work. We have been obliged quite frequently to deny ourselves certain facilities in the way of apparatus and material and thus have been put in a position of disadvantage with regard to the problems investigated. In the matter of salaries paid to the instructors, especially to the junior instructors, it has been recognized that these positions are valuable, mainly for the opportunities they offer to young men to gain experience and to make themselves known by investigations. In this respect the school has been generous, for the work of teaching is never so onerous as to deprive ambitious men of the leisure time for individual work. But the remuneration attached to these positions is so small that it is becoming difficult to meet the competition of other institutions in which larger salaries are paid. Moreover, in recent years numerous better paid positions of the same character have developed in the clinical laboratories and in the special institutions for medical research, and it would seem to be necessary for us to meet these new conditions by advancing our scale of salaries. I believe it will be found that the salaries we pay our assistants and instructors in the laboratories of the underlying subjects take a very low rank compared with similar positions in other institutions. In the matter of trained technical attendants it is generally stated that American laboratories are markedly deficient, as compared with foreign laboratories. The utilization of this kind of assistance adds greatly to the efficiency and productivity of a laboratory since these men take care of much of the drudgery of routine preparations that otherwise falls upon the staff. In the physiological laboratory we attempt to train men of this character, but it has not been possible so far to free them from ordinary janitorial duties or to hold out the reward of an adequate wage for specially skilled service. The organization of the laboratory would be much more effective if we could provide separately for janitorial work and for trained technical attendants.

W. H. HOWELL,
Professor of Physiology.

GREEK

GREEK SEMINARY

Professor Gildersleeve conducted the Greek Seminary, the plan of which is based on the continuous study of some leading author or some special department of literature.

The Seminary consists of the director, fellows, and scholars, and such advanced students as shall satisfy the director of their fitness for an active participation in the work by an essay, a critical exercise, or some similar test of attainments and capacity. All graduate students, however, may have the privilege of attending the course.

During the last academic year the study of *Aristophanes and the Old Attic Comedy* constituted the chief occupation of the members. There were two meetings a week until March 17, chiefly for the criticism and interpretation of the author, but auxiliary studies in the literary and political history of the period also found place in the plan of the Seminary, and one meeting a week after January 1 was given to lectures on *Aristophanes and his Times*.

From March 22, Associate Professor Miller had charge of the work of the Seminary, and *Menander* was the subject of study.

ADVANCED AND GRADUATE COURSES

1. Professor Gildersleeve conducted a course of *Practical Exercises in Greek*, consisting chiefly in translation at dictation from Greek into English and English into Greek, two meetings a week from the beginning of the session to the first of January.

2. He gave a course of lectures on *Aeschylus, Sophocles, and Euripides*, with readings once a week, the second half-year.

Associate Professor Miller conducted the following courses:

1. *Readings in Sophocles*, weekly throughout the year.

2. Lectures on *Greek Metres*, with practical exercises, twice a week till March 18.

3. Exercises in advanced *Greek Composition* for the benefit of candidates for the degree of Doctor of Philosophy, weekly, second half-year.

Professor Robinson conducted readings in *Aeschylus*, weekly throughout the year.

UNDERGRADUATE COURSES

Professor Robinson:

History of Greek Literature. *One hour weekly, through the year.*

Associate Professor Spieker:

Benner-Smyth's *Beginner's Greek Book*: Xenophon, *Anabasis* I. *Three hours weekly, first half-year.*

Benner-Smyth's *Beginner's Greek Book*. *One hour weekly, through the year.*

Homer, *Iliad*, I, II. *One hour weekly, through the year.*

Lysias, VII, XII, XXIV; Prose Composition. *Three hours weekly, first half-year.*

Euripides, *Iphigenia in Tauris*; Prose Composition. *Three hours weekly, second half-year.*

Plato, *Protagoras*; Lyric Poets; Prose Composition. *Three hours weekly, first half-year.*

Sophocles, *Antigone*; Prose Composition. *Three hours weekly, second half-year.*

Thucydides, VII. *Two hours weekly, first half-year.*

Aristophanes, *Frogs*. *Two hours weekly, second half-year.*

Associate Professor Miller:

Xenophon, *Memorabilia* (selections); Plato, *Apology*; Herodotus (selections); Prose Composition. *Four hours weekly, through the year.*

Undergraduates have read privately for examination the following:

Xenophon, *Hellenica*, I.

Lucian, *Vera Historia*, I.

Aeschylus, *Prometheus*.

Elegiac Poets (selections).

Demosthenes, LIV, LV.

Euripides, *Aloestis*.

Plato, *Crito*.

Homer, *Odyssey* (one book).

PUBLICATIONS

B. L. GILDERSLEEVE:

Editorial and other contributions to the Thirty-fifth and Thirty-sixth Volumes of the *American Journal of Philology*.

C. W. E. MILLER:

Report of *Revue de Philologie*. *American Journal of Philology* XXXV, 346-354.

Ne Extra Oleas. *American Journal of Philology*, XXXV, 456-462.

B. L. GILDERSLEEVE,

Francis White Professor of Greek.

LATIN

The Seminary, which is the most important organ of graduate instruction, consists of the director, fellows, scholars, and such graduate students as have given satisfactory proof of their ability and training. Each year special attention is given to some one department of the literature. During the session just completed the centre of work has been the Roman Bucolic Poets—Vergil, Calpurnius, and Nemesianus. The members prepared papers founded upon various special investigations, and presented in turn critical and exegetical commentaries upon given passages of those authors. Two meetings a week were held, through the year.

In addition to the Seminary course and the auxiliary work, Professor Mustard lectured once a week through the year on the Pastoral from Theocritus to Spenser.

The members of the Seminary met once a week through the year for the systematic reading of Greek and Latin Pastoral.

Undergraduate courses were conducted as follows.

Collegiate Professor Mustard:

Latin I: Livy (selections); Vergil, *Bucolics*; Horace, *Odes*. *Three hours weekly, through the year.*

Dr. Magoffin:

Latin I: Latin Composition. *Weekly, through the year.*

Latin II: Tacitus, *Annals*, bks. I-II; Pliny, *Epistles*, bk. VI; Catullus. *Three hours weekly, through the year.*

Latin III: Selections from the Latin literature of the Early Empire. *Two hours weekly, through the year.*

PUBLICATIONS

W. P. Mustard.

The Piscatory Eclogues of Jacopo Sannazaro, edited with Introduction and Notes. Baltimore: *The Johns Hopkins Press*, 1914 (October 27).

Review of Angelo Taccone's "Gli Idilli di Teocrito tradotti in versi italiani." *Classical Philology*, vol. ix, July, 1914, pp. 337-338.

Notice of A. Benedetti's "L'Orlando Furioso nella Vita intellettuale del Popolo inglese." *American Journal of Philology*, vol. xxxv, Dec., 1914, p. 500.

Notice of A. Rostagni's "Sull' autenticità dell' Idillio VIII di Teocrito." *Classical Philology*, vol. x, Jan., 1915, p. 105.

Report of Rheinisches Museum für Philologie, vol. lxix. *American Journal of Philology*, vol. xxxv, Dec., 1914, pp. 482-484, and vol. xxxvi, March, 1915, pp. 99-101.

Notice of H. M. Hall's "Idylls of Fishermen." *Modern Language Notes* vol. xxx, March, 1915, p. 96.

The Pastoral, Ancient and Modern. *The Classical Weekly*, vol. viii, March 27, 1915, pp. 161-167.

Notice of Sir J. E. Sandy's "Short History of Classical Scholarship." *American Journal of Philology*, vol. xxxvi, June, 1915.

Notice of Enrico Cocchia's "Introduzione storica allo studio della letteratura latina." *American Journal of Philology*, vol. xxxvi, June, 1915.

Reports of *Revue de Philologie*, vols. xxxvi and xxxvii. *American Journal of Philology*, vol. xxxvi, June, 1915, pp. 213-219.

Notes on the Piscatory Eclogues of Jacopo Sannazaro. *Athenaeum* (Pavia), vol. liii, July, 1915, pp. 343-344.

WILFRED P. MUSTARD,
Acting Director of the Latin Seminary.

CLASSICAL ARCHAEOLOGY AND ART

The work in Classical Archaeology and Art has been carried on by means of the Archaeological Seminary, various courses of lectures and practical exercises, demonstrations in the museum of the University, and especially by means of daily conferences with individual students. The members of the Seminary, meeting weekly, devoted their attention to Greek and Roman Inscriptions, especially Greek Inscriptions of Roman times; and papers of original research were presented from time to time on topics previously arranged and on unpublished inscriptions.

In addition to his direction of the Seminary for the year, Professor Robinson lectured once a week through the year on the History of Greek and Roman Sculpture; and once a week on the Topography of Greece and Asia Minor. In the Greek Department he gave a course of readings and lectures on Aeschylus throughout the year, and he also lectured once a week on Greek Literature in English Translations. During the year Professor Robinson has given a number of public lectures before such learned societies as the Art and Archaeology League of Washington, the School Arts League of Baltimore, the Archaeological Society of Philadelphia, the Society for the Promotion of Liberal Studies of Philadelphia, the College Art Association at its meeting in Buffalo, and at Goucher College. In the spring of 1914 he lectured at twenty-one University centres in the Western United States and Canada. His subjects have been: "The Seven Churches of Asia Minor"; "The Comic, Grotesque, and Caricature in Classical Art"; and "When we teach Art, What are we Teaching?" Professor Robinson also attended the meeting of the American Philological Association and the Archaeological Institute of America, at which he read a paper; and he took part in the meetings of the American Federation of Arts at Washington, and of the Classical Association of the Atlantic States at Swarthmore, at which latter Dr. Magoffin read an illustrated paper on the Johns Hopkins Archaeological Museum. At the dedication of the new Classics Building of the University of Chicago, Professor Robinson spoke on the Classical Work of Johns Hopkins and Chicago and the relations of the classical departments of the two Universities.

Dr. Magoffin has lectured once a week through the year on Roman Topography, illustrating the topographical and geological formation of central Italy by means of photographs and with the tufas, peperinos, travertines, pozzolanos, and other materials from the archaeological museum. The development of the city of Rome and the growth of the Forum Romanum were the chief subjects of study.

The undergraduate course in Roman Life has been carried on in the main by illustrated lectures, visits to the Museum, and work in class with coins, household utensils, bits of pottery and building materials.

Lectures were given under the auspices of the Archaeological Society by Professors H. C. Butler, Walter Dennison, Clarence Ward, Mitchell Carroll, and Mr. Richard Fuller. Miss Esther B. Van Deman, Associate of the Carnegie Institution in Rome, gave a public lecture on "Roman Remains in Africa," and two lectures on "The Roman Forum" to the students of the Classical Departments.

The degree of Doctor of Philosophy was granted to two students—Miss Mary E. Armstrong, whose dissertation was on "The Significance of Color in Roman Ritual"; and Miss Emily Ledyard Shields, whose dissertation was on "The Cults of Lesbos." Miss Cornelia G. Harcum, who took the Doctor's degree in 1913, has published her dissertation on "Roman Cooks," and many of the former students of this Department have published articles during the year which need not be listed here. Miss Harcum has been appointed instructor in Vassar, Miss Bourne (Fellow by Courtesy this year) has been appointed instructor at Mt. Holyoke, Miss Shields instructor at Smith College, and Miss Armstrong instructor at Goucher College.

Needs.—The needs of the Department of Archaeology and Art, which was established only ten years ago, and which has received inadequate appropriations, are great. Many of the important archaeological publications are lacking in the library and funds are especially needed to purchase photographs, to mount and care for those we have, to buy some of the more expensive illustrated archaeological books, to provide a fine collection of lantern slides, and to purchase antiquities and casts to add to our excellent archaeological museum. Funds are also needed to publish a catalogue of the museum and especially of the beautiful collection of coins, which was recently presented by one of our former trustees, Mr. Buckler. Ultimately a chair of mediæval and modern art should also be established. Money is needed for all these things and there are always many opportunities for archaeological research such as the excavation of Sardis, which has already yielded things of the highest artistic and linguistic importance, the inscriptions being published by Mr. Buckler and Professor Robinson.

PUBLICATIONS

David M. Robinson.

Greek Literature in English Translations. *Classical Weekly*, vol. viii, 1915, pp. 153-156.

Greek Inscriptions from Sardes, IV. *American Journal of Archaeology*, xviii, 1914, pp. 35-74; V. *American Journal of Archaeology*, xviii, 1914, pp. 321-362 (with W. H. Buckler).

Two Unpublished Vase Illustrations from Homer. *American Journal of Archaeology*, xix, 1915, pp. 78-79.

Discovery of the Tomb of Osiris in Egypt. *Art and Archaeology*, i, 1914, p. 85.

Statuette from Crete. *Art and Archaeology*, i, 1915, pp. 211-212.

Recent Discoveries at Cyrene. *Art and Archaeology*, i, 1915, pp. 212-214.

Bronze Statue of a Roman Boy. *Art and Archaeology*, i, 1915, pp. 214-215.

Mosque of St. Sophia at Constantinople. *Art and Archaeology*, i, 1915, p. 258.

Review of Powers' Message of Greek Art. *Art and Archaeology*, i, 1914, pp. 44-45; also *Classical Weekly*, vii, 1914, pp. 29-32.

Review of Gardner's Principles of Greek Art. *Art and Archaeology*, i, 1914, pp. 88-89.

- Review of Smith's Greek Art and National Life. *Art and Archaeology*, i, 1914, pp. 89-90.
- Review of Waldstein's Greek Sculpture and Modern Art. *Art and Archaeology*, i, 1914, p. 135.
- Review of Clark's Holy Land of Asia Minor. *Art and Archaeology*, i, 1915, p. 176.
- Review of Bosanquet's Days in Attica. *Art and Archaeology*, i, 1915, pp. 263-264.
- Review of Davis's A Day in Old Athens. *Art and Archaeology*, i, 1915, p. 264.
- Review of Manatt's Aegean Days. *Art and Archaeology*, i, 1915, p. 264. Also *Classical Weekly*, viii, 1915, pp. 150-151.
- Review of Whiting's Athens the Violet-Crowned. *Classical Weekly*, viii, 1915, pp. 101-103.
- Review of Seaton's Apollonius Rhodius, the Argonautica. *Classical Weekly*, vii, 1914, pp. 172-173.
- Review of Mooney's The Argonautica of Apollonius. *Classical Weekly*, vii, 1914, pp. 173-176.
- Review of Besnier's Lexique de Géographie Ancienne. *American Historical Review*, xix, 1914, pp. 918-919.
- Editorial work for *Art and Archaeology* and for the *Classical Weekly*.

Ralph Van Deman Magoffin.

- Review of Ferguson's Greek Imperialism. *American Political Science Review*, viii, 1914, pp. 112-113.
- The Teaching of Roman History, I. *History Teachers' Magazine*, vii, No. 7, Sept., 1914, pp. 209-218.
- The Modern Making of Ancient History. *Classical Journal*, x, No. 2, Nov., 1914, pp. 63-71.
- Review of Frank's Roman Imperialism. *American Political Science Review*, viii, 1914, pp. 691-694.
- Latin Inscriptions at the Johns Hopkins University, viii (with H. L. Wilson, deceased). *American Journal of Philology*, xxxv, 1914, pp. 421-434.
- Review of Frank's Roman Imperialism. *American Journal of Philology*, xxxv, 1914, pp. 500-501.
- Review of Douglas's A Theory of Civilization. *The Classical Weekly*, vii, Feb. 6, 1915, pp. 117-118.
- Review of Barbagallo's Un Semestre d'Impero Repubblicano. Il governo di Galba. *American Journal of Philology*, xxxvi, 1915, p. 115-116.
- Review of Stobart's The Glory that was Greece, and The Grandeur that was Rome. *Art and Archaeology*, i, 6, 1915, p. 262.

DAVID M. ROBINSON,

*Professor of Classical Archaeology and Epigraphy,
Lecturer on Greek Literature.*

SANSKRIT AND COMPARATIVE PHILOLOGY

During the session of 1914-15 advanced work in Indian Philology concerned itself with the Vedas; with Hindu fiction both in Sanskrit and in Prakrit; and with Buddhist Literature in Pāli.

The Vedic Seminary, that is the Seminary for the study of the most ancient phase of Hindu language and literature, was engaged in the study of the Atharva-Veda. The peculiar position which Atharvanic studies have held in the past in this University is described in the President's Annual Report for 1904 (*Johns Hopkins University Circular*, No. 173, p. 41). Professors Barret (Ph.D., 1903) in Trinity College, Hartford, and Edgerton (Ph.D., 1909) in the University of Pennsylvania, are engaged at present in elaborating Books V and VI of the Kashmirian version of the Atharva-Veda (published in chromophotographic reproduction by Johns Hopkins University and Tübingen University in 1901). This in sequel to Professor Barret's previous editions of Books I-IV in recent volumes of the *Journal of the American Oriental Society*. The Seminary handled Book V of the same Veda in the Čaunaka version. The criticism of the text and its interpretation yielded some new results in the understanding of this book on ancient Hindu customs, to be published at the proper time.

The second phase of advanced work dealt with Hindu fiction. During the first part of the year the novel of Bambhadatta (Brahmadatta), in the Prakrit dialect called Māhārāṣṭrī, was read and compared with similar themes in Hindu literature. After that the quasi-biographical Sanskrit collection of stories, known as *Parīkṣitaparvan*, composed by the Jain monk Hemacandra, was read critically with a view to a possible first translation of that work in English.

Dr. Burlingame, Johnston Scholar in Sanskrit, conducted an advanced course in Pāli, the classical language of the Southern Buddhists. Selections from the commentary on the *Dhammapada*, a translation of which by Dr. Burlingame is now in process of publication, and selected chapters from the *Suttas* (*Sutta-Piṭaka*) were the themes. Dr. Burlingame has ready for the press a catena of Pāli Notes, some of which are the product of this year's work.

During the second half-year a beginner's course in Veda was given. This is intended to introduce into the language and literature of the earliest Hindu period, and to correlate the Vedic dialect with Classical Sanskrit. Preliminary study of Vedic grammar and metre was followed by the interpretation of selected hymns of the *Rig-Veda*.

A more elementary course in Classical Sanskrit, carried on during the first half-year, was devoted to the interpretation of the *Hitopadeśa*, the most popular book of Hindu beast-fables.

The work in Comparative Philology was two-fold. First, the annual course of lectures on General Comparative Philology. This began with a definition of the theme and its relation to History, followed by a brief sketch of the history of the science. The bulk of the lectures dealt with the linguistic Ethnology of the Indo-European peoples, their divisions, special interrelations and their ori-

ginal home (the so-called Aryan question). This was followed by sketches of the individual peoples of the family: India, the Vedas, Brahmanism, Sanskrit Literature, and Buddhism; Persia, the Achemenidan cuneiform inscriptions, the Zoroastrian Literature (*Avesta*) and religion; the minor and problematic Indo-European peoples; and, finally, similar sketches of the European peoples and their national religions. .

A second course, weekly, through the year, was devoted to the elements of Comparative Grammar of the Indo-European languages. The particular subject treated was the history of the consonants, with especial reference to Greek, Latin, German, and Sanskrit. The course was preceded by exercises in the physiological phonetics of the consonants.

Dr. Kuno Meyer, Professor in the Universities of Berlin and Liverpool, delivered two celtological lectures: one on Ancient Irish Poetry; the other, on Races and Languages of Great Britain and Ireland. Even so passing a glimpse of the language and literature of a great group of peoples is of absorbing interest. It calls to mind one of the pressing needs of this University, namely, more permanent and systematic instruction and research in Celtic and Balto-Slavic language and literature.

The school of Sanskrit and Comparative Philology has a double aspect, as its name indicates. At the time of my appointment (some 35 years ago) to the teachership of Sanskrit and Comparative Philology it was still customary to assign to one man the caretaking of both subjects. Both subjects were new, relatively speaking; the work of the professor was largely to impart enough of either or both subjects to serve as a basis for broader or sounder scholarship in other lines of philology.

In due time each study made its own independent career. The manifold languages and literatures of India and the countries dependent upon India's intellectual leadership developed the study of Sanskrit into the study of Indology. Indological literature is now to be compared in extent and importance with the combined literatures of Europe, rather than with the literature of any single European country.

Comparative Philology of the Indo-European peoples and languages for its part has similarly developed and deepened. Especially Iranic, Balto-Slavic, and Celtic philology call for independent treatment. In the past of the University starts have been made at various times in these directions. Some few years ago I taught here a class of seven students in Lithuanian. Classes in Avestan, the most ancient Persian literature, I have conducted profitably again and again during my occupancy of the chair. Dr. Franklin Edgerton, one of our own Doctors of Philosophy, now Professor of Indology at the University of Pennsylvania, conducted successfully classes in Slavic and Russian during several years.

More than once I have been at the point of pressing for permanent assistance in the shape of an adjunct professorship of Comparative Philology, checked only by considerations of ways and means. The number of students in either Sanskrit or Comparative Philology has never been large, and subjects more "practical" have naturally

claimed the right of way. Nevertheless, the work in this school, as can be easily shown by its history, has been very important to the University. Its proper expansion is one of our great *desiderata*.

The second, not less ardent, need of our work is a substantial fund for publication. We need the money for a series of treatises under the title of say, "Oriental and Linguistic Memoirs of the Johns Hopkins University." My own work as well as that of my pupils is published largely by other universities. I have printed two of my most substantial works in the Harvard Oriental Series. Drs. Edgerton and Burlingame have ready (awaiting their turns in the Harvard Oriental Series) important books which might be published here but for the lack of funds. Dr. Blake, of the Shemitic school, has ready for the press a scientific Grammar of the Philippine dialects which belongs to such a series as the one which I contemplate. There is no scholarly activity which could possibly gather together our work and mark its importance better than a series of treatises on Oriental and Linguistic subjects. I know of nothing that would stimulate more effectively the interest of first-class young scholars in humanistic studies.

With reference to both of the propositions which I have just made, it may be said with some show of justice that they are in the nature of luxuries. I am willing to risk the paradox that a University of the first order can get along better without some necessities than without such luxuries. But why not have both?

PUBLICATIONS

Maurice Bloomfield.

A Plea for more Classical Education. *The Johns Hopkins Alumni Magazine*, vol. ii, pp. 267-275.

Review of Feist, Kultur, Ausbreitung, und Herkunft der Indogermanen. *The American Historical Review*, vol. xix, pp. 840-843.

On Talking Birds in Hindu Fiction. "Festschrift, Ernst Windisch zum siebenzigsten Geburtstag dargebracht," pp. 349-361.

MAURICE BLOOMFIELD,

Professor of Sanskrit and Comparative Philology.

ORIENTAL SEMINARY

In the Oriental Seminary, under the direction of Professor Haupt, twenty-eight courses in the various departments of Oriental research were given during the past year, special attention being paid to the Old Testament and the cuneiform inscriptions bearing on the Scriptures.

Twenty hours during the first half-year, and twenty-one hours during the second, were devoted to the study of *Hebrew and the Old Testament*. In the *Old Testament Seminary*, two hours weekly, through the year, Professor Haupt interpreted the Book of Hosea.

He also conducted, through the year, a series of weekly exercises in *Hebrew Prose Composition*, the students translating idiomatic English sentences into Hebrew, and gave, through the year, a course in *Comparative Hebrew Grammar* with special reference to the suffixes of the verb and the noun. The instruction in *Elementary Hebrew* was given by Dr. Rosenau, while the Rayner Fellow in Semitic, Mr. Albright, conducted a course in *Hebrew for Beginners*, each three hours weekly, through the year. Associate Professor Ember gave the *Second Year's Course in Hebrew*, two hours weekly, through the year, and a *Third Year's Course* was conducted by Associate Professor Ember in conjunction with Dr. Rosenau, two hours weekly, through the year. Dr. Blake gave, through the year, a series of lectures on *Hebrew Syntax*, and conducted a course in *Hebrew Grammar*, two hours weekly, through the year, paying special attention to the minute grammatical analysis of selected texts and to the forms of the irregular verbs. Dr. Rosenau conducted a course in *Post-Biblical Hebrew*, two hours weekly, through the year, interpreting extracts from the Mishnah and Talmud and selections from Rabbinical commentators. A course in *Hebrew Conversation* was given, through the year, by Mr. Rabinowitz.

Dr. Blake conducted, during the second half-year, a course in *Aramaic Grammar and Interpretation of the Aramaic Portions of the Books of Daniel and Ezra*.

The lectures on the *History of the Ancient East* (Egypt, Babylonia, Assyria, Persia, Israel, and Judah) were given, through the year, by Dr. Blake.

In *Syriac*, an elementary course was given by Dr. Blake, selections being read in the three varieties of Syriac script, Jacobite, Estrangelo, and Nestorian.

In *Arabic*, Professor Haupt conducted weekly exercises in *Arabic Prose Composition*. Associate Professor Ember gave courses in *Jewish Arabic* as well as in *Arabic Poets* (Nöldeke's *Delectus*) and *Prose Writers* (Fischer's *Chrestomathy*)—all through the year. A course in *Selections from the Arabian Nights* was given, through the year, by Mr. Rabinowitz who also met a class, through the year, for the *Cursive Reading of Arabic Texts*.

Four hours weekly, through the year, were devoted to the study of *Assyriology*. Professor Haupt gave, during the first half-year, a course in *Cuneiform Historical Inscriptions*, interpreting the Broken Prism of Esarhaddon, the Annals of Shalmaneser III, and the Hunting Inscriptions of Sardanapalus. During the second half-year Professor Haupt interpreted the *Cuneiform Account of the Deluge*. The instruction in *Elementary Assyrian* was given by Mr. Albright through the year. Dr. Duncan conducted courses in *Assyro-Babylonian Letters* and the *Code of Hammurabi*, both through the year.

In *Egyptology*, Associate Professor Ember conducted courses in *Elementary Egyptian*, *Hieroglyphic Inscriptions*, *Select Hieratic Papyri*, and *Pyramid Texts*, each weekly, through the year.

The instructors of the Oriental Seminary met weekly, through the year, to present new discoveries, and report on important articles in the leading Semitic journals.

At the meeting of the American Oriental Society, held at New York, April 8-10, thirteen papers were presented by members of the Oriental Seminary, *vis.* Professor Haupt: (a) The cuneiform names of Damascus; (b) Arabic *samm*, poison = Sumerian *šem*, aroma; (c) The Assyrian terms for 'sport'; (d) Hebrew *leq*, saucy, and *melleq*, interpreter.—Associate Professor Ember: (a) New Semito-Egyptian words; (b) A Semitic loan-word in Latin; (c) Semitic words surviving in Egyptian sign-values.—Dr. Blake: (a) Mixed constructions in Hebrew and Aramaic; (b) The etymology of Aramaic *ith*, to be; (c) The syntax of Hebrew numerals and numeral expressions.—Mr. Albright: (a) The home of Balaam; (b) The conclusion of Esarhaddon's Broken Prism; (c) Some unexplained cuneiform words.

At the annual meeting of the Society of Biblical Literature, held in New York, December 28 and 29, Professor Haupt read the following papers: (a) Hosea's Erring Spouse; (b) The Hebrew noun *melkh*, counsel; (c) To know = to have sexual commerce; (d) Assyrian *atmu*, fledgling, in the Old Testament.

At the meetings of the University Philological Association the following papers were read by members of the Oriental Seminary: Professor Haupt (October 16, 1914): The Song of Deborah; Associate Professor Ember (October 16, 1914): Eulogy on Professor Christopher Johnston and (March 19, 1915): The etymology of the Latin word *marra*; Mr. Albright (March 19, 1915): Studies in cuneiform archaeology.

At the general meeting of the American Philosophical Society, held in Philadelphia, April 22-24, Professor Haupt presented a paper on Opium in the Bible.

The twenty-second quarto volume (232 pp.) of the Assyriological Library, edited by Professor Haupt in conjunction with Professor Delitzsch, of Berlin, appeared in December, 1914. It contains an interesting contribution to the history of medicine, *vis.* an interpretation of Babylonian and Assyrian birth-omens by Dr. Ludwig Dennefeld. The first part (pp. 1-40) of vol. xxiii, containing the first two chapters of an elaborate work on Babylonian Astronomy by Dr. E. Weidner, was issued at the end of the session. The dissertation of Dr. W. G. Seiple on the Seventy-second Psalm (preprinted from the *Journal of Biblical Literature*, vol. xxxiii, pp. 170-197) was published at the beginning of the second half-year.

Professor Felix von Luschan, of the University of Berlin, gave two lectures (December 14 and 15) on Excavation of a Hittite Capital and Anthropology of Western Asia.

The Library, under the charge of Associate Professor Ember, was enriched by a number of important additions in the various branches of Oriental Research.

The most pressing needs of the Oriental Seminary are:

(1) the appointment of an Assyriologist to conduct the courses given by the late Professor Johnston, Drs. Poebel and Schick.

(2) a less inadequate appropriation for new books in the various departments of Oriental research, including Assyriology, Egyptology,

Biblical Philology, Oriental History and Archæology, Hebrew, Talmud, Rabbinical Literature, Arabic, Persian, Turkish, Jewish Aramaic, Syriac, Ethiopic, Amharic, Phenician, Sabeian, Philippine dialects, etc., etc.

PUBLICATIONS

Paul Haupt.

Armageddon (Presidential Address at the Annual Meeting of the American Oriental Society, Boston, April 16, 1915). *Journal of the American Oriental Society*, vol. 34, pp. 412-427.

The Inauguration of the Second Temple. *Journal of Biblical Literature*, vol. 33, pp. 161-169.

Hebrew *leht*, cheek, and *lôa'*, jaw. *Journal of Biblical Literature*, vol. 33, pp. 290-295.

Samson and the Ass's Jaw. *Journal of Biblical Literature*, vol. 33, pp. 296-297.

The Grain-mowing Month. *Journal of Biblical Literature*, vol. 33, p. 298.

Hebrew *argamân*, red purple, and *tekélth*, blue-purple. *Journal of Biblical Literature*, vol. 33, pp. 298-299.

Opium in the Bible (Abstract). *Program of the General Meeting of the American Philosophical Society*, Philadelphia, April, 1915.

Die altbabylonische Invasion Ägyptens. *Orientalistische Literaturzeitung*, vol. 17, pp. 342-343 (September, 1914).

Assyr. *tītānu*, Nord = hebr. 'aš, Bärengestirn. *Orientalistische Literaturzeitung*, vol. 17, pp. 421-422 (October, 1914).

Sumer. *me* älter als *ge*. *Orientalistische Literaturzeitung*, vol. 17, pp. 454-456 (November, 1914).

Kedorlaomer und Serubbabel. *Orientalistische Literaturzeitung*, vol. 18, pp. 70-73 (March, 1915).

Lat. *asinus* und semit. *atān*, Eselin. *Orientalistische Literaturzeitung*, vol. 18, pp. 203-205 (July, 1915).

Die Eselstadt Damaskus. *Zeitschrift der Deutschen Morganländischen Gesellschaft*, vol. 69, pp. 168-172.

Zum Deborahliede. *Zeitschrift für die alttestamentliche Wissenschaft*, vol. 34, pp. 229-231.

Schmücket das Fest mit Maien. *Zeitschrift für die alttestamentliche Wissenschaft*, vol. 35, pp. 102-109.

Paul Haupt, Co-editor.

Assyriologische Bibliothek, herausgegeben von Friedrich Delitzsch und Paul Haupt, vol. xxii. *Babylonisch-assyrische Geburts-Omina zugleich ein Beitrag zur Geschichte der Medizin*, von Ludwig Deneffeld, viii + 232 pp. 4°. (Leipzig, 1914.)

Assyriologische Bibliothek, herausgegeben von Friedrich Delitzsch und Paul Haupt, vol. xxiii. *Babylonische Astronomie von E. Weidner*, Part I, 140 pp. 4°. (Leipzig, 1915.)

Aaron Ember.

Egyptian *hw*, to proclaim, announce = Hebrew *hiwôdh*, Arabic *wāhā*. *Orientalistische Literaturzeitung*, vol. 17, pp. 6-7.

William Rosenau.

Sefer Tanchumoth (Book of Consolation). *Lord Baltimore Press*, Baltimore, 1914.

A Call to the People—The Greater Need of Charity. *Jewish Comment*, Baltimore, vol. 44, No. 5 (October 30, 1914).

A Necessary Local Survey. *Jewish Comment*, Baltimore, vol. 44, No. 8 (November 20, 1914).

The Jew and the European War. *Emanu-El*, San Francisco (December 7, 1914).

The Warrant for Jewish Community Organization. *Jewish Comment*, Baltimore, vol. 44, No. 22 (February, 1915).

Religion as Worship. *Jewish Comment*, Baltimore, vol. 44, No. 23 (March 5, 1915).

The Elijah Vision and its Message. *Reform Advocate*, Chicago, vol. 49, No. 6, p. 166 (March 6, 1915).

Is the Despair of the Zionists Warranted? *Jewish Comment*, Baltimore, vol. 45, No. 1 (April 2, 1915).

Synagogal Social Service Work. *Jewish Charities*, vol. 5, No. 9, p. 215 (April, 1915).

Frank R. Blake.

Professor Johnston as an Orientalist. *The Johns Hopkins Alumni Magazine*, vol. 3, No. 1, pp. 17-24.

George S. Duncan.

The Sumerian inscriptions of Sin-Gâsid, King of Erech, transliterated and translated, and annotated. *American Journal of Semitic Languages*, vol. 31, pp. 215-221.

PAUL HAUPT,

*W. W. Spence Professor of Semitic Languages
and Director of the Oriental Seminary.*

ENGLISH**I. Advanced Courses.**

The advanced students in English are organized into a Seminary, which is conducted by Professor Bright. Graduate students are admitted to the Seminary as soon as they have satisfied initial requirements for specialization and research. The discipline of the Seminary is designed to impart training in scholarly methods of dealing with literary and linguistic problems. Study and investigation are bestowed on selected periods of literary and linguistic history, on departments of literature extending through successive periods, and on the works of important writers, taken separately or in groups. Usually there is a change of subject each half-year. During the academic year 1914-1915, the sessions of the Seminary occupied four hours a week.

The subject studied was the Romantic Movement in English Poetry. A prolonged investigation of the character and influence of the Ossianic Poems of James Macpherson in England and on the Continent was followed by a study of Ballad-literature, with special reference to the theories of composition and authorship of the popular ballad. In connection with these subjects reports were prepared on the *Mabinogion* and on the *Kalevala*. The complete works of the following writers were reviewed in detail, with the effort to arrive at judgments concerning the literary and philosophic tendencies of the period: Thomas Chatterton, Robert Fergusson, Robert Burns, Oliver Goldsmith, Thomas Gray, William Collins, William Cowper, George Crabbe. The preparation was thus secured for an examination of the poetic theory of Wordsworth. The work of the Seminary was finally centered in a critical reading of *The Prelude*. The conductor of the Seminary also gave several lectures on the æsthetic doctrine of Hegel; and the members of the Seminary followed the lectures of Professor Lovejoy on the Philosophy of Romanticism.

Professor Bright met a class once a week for a study of Middle English literature. The poem *Pearl* was read with minuteness, and the poems that are associated with it in views concerning authorship were read in a more summary fashion, and reports of them submitted for discussion. During the last third of the year the class read the first principal division of *Piers the Plowman*.

He also met the same class once a week for the interpretation of Anglo-Saxon texts. This exercise was confined during the first half-year to the poems in the *Chronicle*; in the second half-year to the *Beowulf*.

Professor Bright lectured twice a week on Anglo-Saxon Grammar, and expounded the subject on the basis of Wright's *Old English Grammar*. He also conducted a class (two hours a week) in Anglo-Saxon. The course was designed to introduce advanced students to the subject.

The Journal Club of the Seminary was conducted by Professor Bright. Sessions of two hours on alternate Fridays were held for reports of the linguistic and literary contributions in the Journals.

2. College Courses.

English Composition 1, a prescribed course in Rhetoric and English Composition, was given, three hours weekly, through the year. The class met in four sections, which consisted at organization of about twenty-eight men each. Section 1 was taught by Associate Professor French, Sections 2 and 3 by Dr. Myers, and Section 4 by Mr. Rollins. The work of the course included, besides the study of the principles of prose composition, the regular writing of themes and essays, the reading month by month of certain prescribed works in prose and verse, and, on the more important of the essays, private conferences with the instructors. James W. Linn's *The Essentials of English Composition* was used as a text-book of Rhetoric, and Francis C. Lockwood's *The Freshman and His College* served at the same time as a collection of specimens of expository prose and a source of helpful advice to first-year students.

Dr. Myers conducted, once a week, a class in English Composition 2, prescribed for all students graded less than "8" in English Composition 1. The principles of structure and diction were reviewed, and practice in writing was afforded by weekly themes, which were criticised in class. The text-book used was J. W. Linn's *Essentials of English Composition*.

English Literature 1 was conducted by Professor Greene, three hours a week, through the year. This class made a general survey of English Literature from the beginning until about 1625. A considerable amount of the poetry of Chaucer, of Spenser, and of Shakspeare, was studied critically in the class-room, and more was privately read by the members of the class: Books XVIII-XXI of Sir Thomas Malory's *Morte Darthur* and Book II of Sir Thomas More's *Utopia* were also included in the private reading. In addition to the regular class-room exercises, five readings from the poems of Chaucer and ten lectures upon the dramas of Shakspeare were given for the benefit of those members of the class who wished to attend them.

English Literature 2 (elective) was given by Professor Greene, three hours a week, through the year. During the first half-year a careful study was made of the minor poems of Milton and of Book I of *Paradise Lost*; Books II and IV were privately read by the members of the class. The second half-year was spent in the study (a) of English forms of verse, (b) of the writings of Dryden, Steele, Addison, and Pope, and (c) of some of the literary features of the English Bible.

English Literature 3 (elective) was given by Professor Greene, three hours a week, through the year. During the first term a study was made of the English and Scottish Popular Ballads, and of the poems of Burns and Scott. During the remainder of the year the course included a study of poetry as represented in the writings of Wordsworth, Coleridge, Byron, Keats, and Shelley, and of the novel as represented in the writings of Scott and Dickens. In connection with the weekly lectures and discussions the members of the class did a large amount of private reading and prepared six papers.

Associate Professor French gave an elective course in American Literature (English Literature 4), three hours weekly, through the year. The course consisted of a rapid survey of literary history and literary biography, followed by a more detailed study of the works of American writers as illustrative of the various literary types. Essays, brief papers, and oral reports constituted an important part of the course. William B. Cairns's *A History of American Literature* was used as a manual and Walter C. Bronson's *American Poems* as a text-book for American poetry.

English Literature 5 (prescribed for technological students) was conducted by Dr. Myers, three hours a week, through the year. The course included a general survey of English literature from the beginning to 1837. Special study was bestowed on the works of selected authors (Chaucer, Spenser, Shakspeare, Milton, Dryden, and Pope) and on the development of certain types of literature and

forms of poetry. Newcomer-Andrews' *Twelve Centuries of English Poetry and Prose* was used for illustrative texts.

Public Speaking 1, a course in Reading and Public Speaking prescribed for undergraduate students in their second year, was given, one hour a week, through the year. The class was divided into ten sections of about nine men each. Five of these sections were taught by Associate Professor French and five by Mr. Albert L. Hammond. The first term was devoted to a study of the elementary principles of expression as presented in Mitchell's *School and College Speaker* and the delivery of selections from the same book. The second and third terms were given to the study and practice of the occasional speech, both prepared and extemporaneous. Knapp and French's *The Speech for Special Occasions* was used as a text-book.

Public Speaking 2, a prescribed course in Debate, was conducted, one hour a week, through the year, by Associate Professor French. The class met in two sections, one of which, for the convenience of engineering students, met at Homewood. The course included lectures on argumentation, class debates and written arguments, and lectures on parliamentary law. J. H. Gardiner's *The Making of Arguments* and Robert's *Rules of Order* were used as text-books.

The "Adams Contest," held on January 29, afforded additional practice in public speaking and debate. Contestants for the Adams medal, chosen from the Class of 1917 by a preliminary contest, and the debating teams of the Classes of 1915 and 1916, also chosen by competitive tests, were trained in delivery by the instructors in public speaking. The Adams trophy and individual prizes were won by the class of 1916, and the Adams medal was won by Mr. Alexander A. Steinbach. On Friday, April 16, a debate between representatives of the Zelosophic Society of the University of Pennsylvania and the Grotius Society of this University was held in Levering Hall. The debate was won by the Grotius Society. The annual intercollegiate debate with the University of Virginia and the University of North Carolina was held on Saturday, April 24. The Johns Hopkins speakers won the first place in the league, defeating Virginia four to one, and winning a unanimous decision against North Carolina. The oratorical contest of the colleges of Maryland and the district of Columbia, under the auspices of the Intercollegiate Peace Association, was held in McCoy Hall, March 19. The first prize was won by the speaker for Loyola College; the representative of Johns Hopkins ranked second. The Group Contest of the South Atlantic States in the same association was held at Johns Hopkins, April 30.

3. College Courses for Teachers.

A course for teachers, designed to cover practically the same ground as the college course in English Composition 1, was given by Dr. Myers. The class met twice a week from October 13 to May 27. J. W. Linn's *Essentials of English Composition* and G. H. Palmer's *Self-Cultivation in English* were used as text-books.

A course in American Literature (English Literature 3) was given by Associate Professor French. The class met regularly, twice a week from October 13 to June 1. The work of the course was as nearly parallel to that of English Literature 4 of the college courses

as circumstances permitted. The writing of essays and reports was an essential part of the course. Cairns's *A History of American Literature* and Bronson's *American Poems* were used as text-books.

4. Public Lectures.

Sir Walter Raleigh, Professor of English Literature in the University of Oxford, delivered (April 8 to April 15, 1915) the twentieth course of the Percy Turnbull Memorial Lectures on Poetry. The theme of the lectures was "Poetry and Criticism of the Romantic Revival"; and the specific subjects of the lectures were (1) Coleridge; (2) Keats; (3) The Reviewers; (4) Hazlitt; (5) Charles Lamb; (6) Landor.

The nineteenth course of lectures on this foundation, delivered by Professor George Lyman Kittredge, has been published under the following title: *Chaucer and his Poetry: Lectures delivered in 1914 on the Percy Turnbull Memorial Foundation in the Johns Hopkins University*. Cambridge, Harvard University Press, 1915.

PUBLICATIONS

Samuel C. Chew, Jr.

The Dramas of Lord Byron: a critical study. [Hesperia, Ergänzungssreihe: Schriften zur englischen Philologie, hrsg. von James W. Bright, 3. Heft.] Göttingen, Vandenhoeck & Ruprecht; Baltimore, The Johns Hopkins Press, 1915. 8c, pp. vi + 181.

John C. French.

Review of "Some recent text-books of Rhetoric." *Mod. Lang. Notes*, xxix, 54-56.

Herbert E. Greene.

"The Nurture of our Youth." *The Johns Hopkins Alumni Magazine*, iii, 7-16.

JAMES WILSON BRIGHT,
Caroline Donovan Professor
of English Literature.

GERMAN

The German Seminary, Section A, met three times weekly through the year, under the guidance of Professor Wood. During the first half-year, the period (1794-1805) of Goethe's and Schiller's literary union, and of their classical production (lyrical and dramatic) was treated. The subjects receiving the fullest treatment were the Ballads, and the Dramas produced in the years preceding and following the French Revolution. During the second half-year, early Middle High German lyrical poetry was studied in the collection *Minnesangsfrühling*.

The Germanic Society, which is conducted by Professors Wood and Collitz, held eight meetings during the year. Besides reports

on the contents of current scientific journals, articles on the following subjects were presented by members of the Society: Timm Kroeger; *Und and joh* in Germanic; The Names and Shapes of the Runic Letters; Ulrich von Zatzikoven; Traces of a High German Original in the *Redentiner Osterspiel*.

Professor Wood gave a graduate course, twice weekly, first half-year on the poetry of Opitz. During the second half-year, the study of Seventeenth Century German Literature was continued, twice weekly, in a course on Grimmelshausen's *Simplicissimus*. A comparison of the German and English Romance of Adventure was made in the works of Grimmelshausen and Daniel Defoe, and fundamental characteristics were pointed out, which distinguish the German-English type of romance from the picaresque novel of the southern nations.

Professor Wood read, with a class of undergraduates, twice weekly, through the year, Goethe's *Faust*, *Iphigenie* and *Götz von Berlichingen*. In the Winter Classes for Teachers, he conducted a reading course, twice weekly, in the German Drama from Grillparzer to Hebbel.

In the (1915) Summer Courses, Professor Wood conducted two courses in work of graduate rank. These classes met five times weekly and studied, respectively the Origin and Development of Modern German, and Goethe's and Schiller's Later Classical Dramas.

The Germanic Seminary (Section B of the Seminary) met twice weekly under Professor Collitz. In both semesters the work consisted chiefly in the interpretation of Old High German texts, starting with selections from Otfried's *Liber Evangeliorum*, and ending with the earliest texts in alliterative meter, such as the *Hildebrandslied* and the *Muspilli*.

The following graduate courses were given by Professor Collitz:

1. Gothic Grammar. *Twice weekly, through the year.* This course served the two-fold purpose of making the students acquainted with the essential features of Gothic grammar, and of introducing them to the study of Comparative Germanic Philology. Special attention was given to the study of the Germanic *Ablaut* and to that of Grimm's, Verner's, and Westphal's laws.

2. Middle Low German Drama. *Weekly, through the year.* The Redentin Easter Play, acknowledged to be the most artistic of the medieval Easter Plays known to us, seemed worthy of being studied in a separate course for advanced students. The drama is preserved in a single manuscript which, in spite of the efforts of various editors, still offers an opportunity for further philological investigation.

Associate Professor Kurrelmeyer gave the following courses:

Middle High German (Introductory Course). *Two hours weekly, first half-year.* After a rapid survey of MHG. grammar, Hartman von Aue's *Armer Heinrich* was read, followed by selections from the *Nibelungenlied*.

Middle High German (Advanced Course). Kudrun. *One hour weekly, second half-year.* Symons' edition was used, the text being translated into modern German.

Associate Professor Kurrelmeyer gave the following undergraduate and special courses:

1. Elementary German. *Four hours weekly, through the year.* Vos, *Essential of German*; Whitney and Stroebe, *Easy German Prose Composition*; Gerstäcker, *Germelshausen*; v. Wildenbruch, *Das edle Blut*; Keller, *Kleider machen Leute*.

2. German 4. Contemporary Literature in rapid readings. *Three hours weekly, through the year.* C. F. Meyer, *Das Amulet, Der Heilige*; v. Wildenbruch, *Der Letzte*; v. Ebner-Eschenbach, *Die Freiherrn von Gemperlein, Krambambuli*; Keller, *Die drei gerechten Kammacher, Frau Regel Amrain*; v. Droste-Hülshof, *Die Judenburghe*; Raabe, *Die schwarze Galeere*; Grillparzer, *Sappho*; Hebbel, *Agnes Bernauer, Herodes und Mariamne*, Ludwig, *Der Erbförster*.

3. Historical German Readings. *Two hours weekly, through the year.* Loening and Arndt, *Deutsche Wirtschaft*; Schiller, *Geschichte des dreissigjährigen Krieges*, III. Buch; Freytag, *Doktor Luther*.

4. Scientific German Readings. *Two hours weekly, through the year.* Lassar-Cohn, *Die Chemie im täglichen Leben*; Walther, *Allgemeine Meereskunde*; v. Helmholtz, *Naturwissenschaftliche Vorlesungen*.

Dr. R. B. Roulston, Associate in German, gave the following undergraduate Courses:

German I, Section A. *Three hours weekly.* Storm, *Auf der Universität*; Arnold, *Einst im Mai*; Keller, *Das Fähnlein der sieben Aufrechten*; Frenssen, *Peter Moors Fahrt nach Südwest*; Sudermann, *Der Katzensteg*; Baumbach, *Das Habichtsfräulein*.

German I, Section B. *Three hours weekly.* Storm, *Auf der Universität*; Raabe, *Die schwarze Galeere*; Chamisso, *Peter Schlemihl*; Sudermann, *Frau Sorge*; Loening and Arndt, *Deutsche Wirtschaft*.

Private Reading (both Sections). Wildenbruch, *Neid*; Saar, *Die Steinklopfer*.

Prose Composition. *One hour weekly* (both Sections). Pope, *Writing and Speaking German*.

German II. *Three hours weekly.* Goethe, *Hermann und Dorothea*; *Der Vikar von Sesenheim*; Schiller, *Maria Stuart*; *Die Braut von Messina*; Goethe, *Gedichte*.

Prose Composition: Whitney and Stroebe, *Advanced German Composition*.

German III. History of German Literature in the Classical Period. Lectures, recitations and readings. *One hour weekly.* Robertson, *History of German Literature*; *The Oxford Book of German Verse*.

Mr. Julius Hofmann conducted Oral Exercises in German with a graduate class, twice weekly, and with a class of undergraduates, once weekly, through the year.

NEEDS OF THE GERMAN DEPARTMENT

The departmental library is in pressing need of additions, particularly from the period of the Sixteenth and Seventeenth centuries. As examples may be mentioned the Publications of the Stuttgarter Litterarischer Verein, and the Weimar edition of the Works of Luther. In the Eighteenth century, certain journal series—such as

Wieland's "Merkur,"—fundamental for the seminary library, are still lacking. Finally, our collection representing German literature from 1880 to the present time requires attention and conservative expansion. On the philological side of Germanics, the recently issued text series in Old Norse, together with single publications such as Wimmer's work on the Danish Runic Inscriptions, and a similar work in Swedish, all of which we still lack, are of prime importance. The modern Scandinavian literatures also call for more adequate representation in our collections, as opportunity may be presented.

PUBLICATIONS

Henry Wood.

The Life of Bettina von Arnim. In: *German Classics for English Readers*, vol. vii. New York, 1914.

Hermann Collitz.

Review of *Hesperia* nr. 1 (Das schwache Präteritum und seine Vorgeschichte von H. Collitz. Göttingen and Baltimore, 1912). *Modern Language Notes*, vol. xxix (1914), pp. 178-181.

Bemerkungen zum schwachen Präteritum. *Indogerm. Forschungen*, vol. xxxiv (1914), pp. 209-222.

William Kurrelmeyer.

Die Erste Deutsche Bibel. Band 10. [266ste Publikation des Literarischen Vereins in Stuttgart]. Tübingen, 1915.

HENRY WOOD,
Professor of German.

ROMANCE LANGUAGES

1. Graduate Courses.

Professor Armstrong conducted courses in the history of the French language as follows: Pronunciation of French, weekly; History of Sounds and Inflections, three hours weekly; Historical Syntax, weekly; Gallic Folk Latin, two hours weekly. He also gave a weekly course of selected readings in Old French literature, a weekly course in the Old French Lyric for the first half-year, and in Old Provençal for the second half-year.

Professor Marden conducted courses on Spanish Epic Poetry, weekly; in Old Spanish Readings, two hours weekly for the first half-year; and on Juan Ruiz' *Libro de Buen Amor*, two hours weekly for the second half-year.

Professor Brush conducted a course in French Classics of the Seventeenth and Eighteenth Centuries, two hours weekly.

Associate Professor Shaw conducted courses in the Interpretation of Selections from Classic Italian Authors, two hours weekly; on the *Canzoniere* of Dante (the Moral and Allegorical Poems), weekly; in Italian Historical Grammar, two hours weekly.

During the months of February and March Professor E. P. Dargan

conducted courses on the History of French Criticism, five hours weekly, and on Nineteenth-Century French Drama, weekly.

The staff and graduate students of the department assembled weekly in the Romance Journal Club for reviews of recent scientific literature and the presentation of papers of departmental interest.

The Seminary in the French Language met two hours fortnightly, under the direction of Professor Armstrong. On the basis of the manuscript scheme established in the Seminary of 1913-1914, 240 lines of the unpublished Old French metrical version of *Barlaam et Josaphat* were constituted, that section of the poem being selected for which there is the fullest manuscript material, so that the work of the year might form the soundest basis practicable for a later constitution of the less fully documented sections. In addition to participating in the text constitution, the members of the Seminary all presented papers on grammatical or lexicographical problems arising in connection therewith.

The Seminary in French Literature met two hours weekly during February and March, under the direction of Professor Dargan, and had as its subject Balzac's realistic method. Twelve of the studies in the *Comédie humaine* were analyzed with reference to such qualities of realism as observation, externality, solidity, materialism, the scientific view-point, and sociological features; also with reference to such technical elements as construction, character and style, the treatment of description and details. Papers were presented by the director of the Seminary, by Messrs. Abbot, Burton, Guigou, Hastings, Havens, Williams, Worthington, and by Misses Dulaney, Hill, and Riddle. In connection with the Seminary work, three students have selected dissertation subjects relating to Balzac. The results obtained from the studies made tend to show the predominance of Balzac in modern fiction and the significance of his methods as the main originator of nineteenth-century realism.

In addition to the scheduled courses, the following lectures were given before the department:

Professor F. M. Warren, of Yale University: "On an Eastern Origin for the Plot of the *Roman de la Rose*"; Professor G. L. Hamilton, of Cornell University: "Parallels to the Rain-Making Fountain in *Yvain*"; Professor R. T. Holbrook, of Bryn Mawr College: "The Farce of Patelin."

2. Collegiate Courses.

French Elements, three sections, each four hours weekly: Section A, by Mr. Worthington; Section B, by Dr. Gruenbaum; Section C, by Mr. Abbot (Sections B and C were for students in Engineering). French 1, two sections, each four hours weekly, by Professor Brush and Dr. Gruenbaum; French 2, three hours weekly, by Professor Brush; French 3-4, three hours weekly, by Professor Brush; French 5, weekly, by Dr. Gruenbaum. Two Special Courses were also given: French Historical Readings, two hours weekly, by Dr. Gruenbaum; French Oral Exercises, two hours weekly, by Mr. Worthington.

Spanish 1, three hours weekly, by Mr. Worthington; Spanish 2, three hours weekly, by Professor Marden; Spanish Literature, weekly after Christmas, by Professor Marden.

Italian 1 and Italian 2, each three hours weekly, by Associate Professor Shaw.

3. College Courses for Teachers.

French 1, the Elements of French, three hours weekly, by Professor Sheffield. French 2, Intermediate French, and French 3, Advanced French, each two hours weekly, by Professor Brush.

Through the liberality of pupils and friends of the late Professor Elliott, there has been established a permanent library fund which is permitting a substantial development of the facilities for the study of French literature. The income from this fund has been applied partly to the purchase of standard editions of French authors, partly to gathering together the critical studies bearing on individual authors or periods which happen at the time to be the object of special study in the French Seminary. The continuance of this process over a series of years is rendering the library exceptionally valuable to workers in a progressively greater number of subjects. It would be of great advantage to the work in Romance Languages if a similar provision could be made for the building up of libraries in Spanish and Italian literature.

EDWARD C. ARMSTRONG,
Professor of the French Language,
Chairman.

HISTORY

SEMINARY IN AMERICAN HISTORY

The seminary in American History was conducted by Professor Latané. The general subject of investigation was the development of American nationality. Among the reports made were the following: "Hamilton's Financial Scheme," by W. K. Gotwald; "The Origin of Political Parties," by K. R. Greenfield; "The Origin of the American Policy of Neutrality," by W. C. Guess; "The Mississippi Question," by W. B. Schulz; "The Jay Treaty," by W. C. Spielman; "The Virginia and Kentucky Resolutions," by W. K. Gotwald; "Opposition to the Annexation and Admission of Louisiana," by W. C. Guess; "The Hartford Convention," by W. W. Marcus; "The Tariff as a Sectional Issue," by W. K. Gotwald; "The Early History of Internal Improvements," by W. C. Guess; "The Origin of the Party Nominating Convention," by K. R. Greenfield; "Frontier Democracy and its Reactionary Influence on the East," by W. B. Schulz; "The Texas Boundary Question," by Paul Fox; "The Relation of the Oregon Question to the Mexican War," by W. K. Gotwald; "The Claims of American Citizens as one of the Causes of the Mexican War," by K. R. Greenfield; "Slidell's Mission to Mexico," by W. C. Guess; "Opposition to the Mexican War," by W. W. Marcus; "Calhoun's Change from Liberal to Conservative," by W. B. Schulz; "Calhoun's Views on Slavery," by W. C. Guess; "Calhoun's Disquisition on Government," by W. K. Gotwald; "Calhoun's Discourse on the Constitution of the United States," by Paul Fox; "A Study of the Journals of the Secession Conventions," by W. B. Schulz.

The following lecture courses were given by Professor Latané:

1. American History, 1789-1865. *Two hours weekly, first half-year.* A study of the constitutional, political, and diplomatic history of the United States to the close of the Civil War, with special reference to the development of American nationality.

2. Latin-American History and Diplomacy. *Two hours weekly, second half-year.* A study of the Spanish colonial system, the war of independence, the recognition of the new republics by the United States and England, the formulation of the Monroe Doctrine, its applications and development, and the political history of the principal Latin-American countries.

3. American History,—for Undergraduates (History 4). *Three hours weekly, through the year.* A general course covering the whole field of American History, based on lectures, text books, and assigned readings.

SEMINARY IN EUROPEAN HISTORY

The seminary in European History was conducted by Professor Vincent. The general subject was the social and economic condition of Germany and England just previous to the Reformation. Topics in this field were assigned to the students for special inquiry. K. R. Greenfield reported on the state of society in Nürnberg; W. B. Schulz on the city of Strassburg; W. K. Gotwald on the state of the printing industry and on posts and communication in Germany; Paul Fox on pre-reformation conditions in Poland, particularly in the city of Dantzic; W. C. Guess on roads and transportation in England. In connection with the seminary work K. R. Greenfield completed his dissertation on "Sumptuary Laws in Nürnberg: A Study in Paternal Government."

Professor Vincent gave the following lecture courses:

1. English Constitutional History. *One hour weekly, through the year.* The foundation of Parliament in the thirteenth century and the development of legislation and administrative authority to the present time.

2. The Period of the Reformation. *One hour weekly, through the year.* The conditions which led to the religious revolution in Germany and Switzerland, with discussion of the present state of research in that field.

3. European History,—for Undergraduates (History 2). *Three hours weekly, through the year.* The first half-year was occupied with a rapid view of the Middle Ages and early modern history as a foundation for the work of the second semester, which was devoted to the Nineteenth Century.

During the year Professor Vincent has continued his studies in the history of sumptuary legislation in Switzerland, but these are not yet ready for publication. He has given public addresses on "The Balkan Situation"; on "The Problem of Neutrality in Switzerland"; on "The Literary Recreations of the History Teacher"; on "Newspaper Revelations of Life in Ohio."

Dr. Ralph V. D. Magoffin conducted the following courses:

1. History of Greece during the Age of Pericles and the Peloponnesian War. *One hour weekly, through the year.* Particular stress was laid upon the development of the Periclean many-sided ideal, with critical consideration of the concomitant growth of democracy and art.
2. History of Rome and Italy from the Accession of Diocletian to the Fall of the Empire of the West, 284-476 A. D. *One hour weekly, through the year.* Especial attention was given to the growth of the Church, to the Barbarian Invasions, and to the spread of the Latin language, customs, and laws over Southern Europe.
3. History of Greece and Rome,—for Undergraduates (History 1). *Three hours weekly, through the year.* The constitutional, political, social, economic, and artistic developments of Greece and Rome were traced by means of translated texts of the ancient historians with the aid of modern authorities. Reports on special topics, with map drawing on the part of the students and occasional illustrated lectures on the part of the instructor, served to expand and emphasize the important phases of this history.

The lectures on the Albert Shaw Foundation for the current session were delivered in November by Professor C. W. Alvord, of the University of Illinois, whose topic was "The Partition of the West in 1783: A Study in Diplomacy."

In the arrangement of courses outlined above it will be seen that many of them cover too much ground, but with the present teaching staff this cannot well be avoided. It is impossible for one man to cover satisfactorily the whole field of mediæval and modern, including English, history, and it is equally unsatisfactory for one man to undertake to cover all periods and phases of American history. The situation in European history will be relieved somewhat during the session of 1915-16 by having Dr. Hazen lecture one hour a week on the Rise of Democracy in France. It is hoped that this arrangement may be continued, or some similar arrangement made, for another year.

The department needs, however, some detailed instruction in American colonial and in English history. These subjects are closely related, and in many universities they are given by the same person. In fact, American colonial history should be taught by a man who is a specialist in English history as well. The addition of such a man to the teaching staff would relieve Professor Vincent, on the one hand, of the work in English history and enable him to give more time to the mediæval period, and it would relieve me on the other hand from the necessity of covering the colonial and revolutionary periods and enable me to give more time to the constitutional, political, and diplomatic history of the period since 1789. In my judgment, therefore, the most pressing need of the department is the engagement of a professor or an associate professor who is a specialist in English constitutional and political history and in American colonial history. I have in mind at least two men who are well equipped for just this work, and if the necessary funds could be provided, there would be no difficulty about getting a thoroughly competent man.

While Dr. Hazen's lectures are helping to fill temporarily the need for a man in the field of modern European history, specially the history of the past century, it is highly desirable that some permanent provision should be made for additional instruction in this field. The addition of two good men to the faculty, one in English and American colonial history and the other in modern European history, would place this department on a footing with the best departments in this country.

PUBLICATIONS

John H. Latané.

Statements, Interpretations and Applications of the Monroe Doctrine and of more or less Allied Doctrines from 1870 to the present day. *Proceedings of the Am. Society of International Law*, 1914, pp. 105-113.

Effects of the Panama Canal on Our Relations with Latin America. *Annals of the Am. Academy of Pol. and Soc. Sci.*, July, 1914, pp. 84-91.

Our Relations with Japan. *Am. Pol. Sci. Rev.*, November, 1914, pp. 583-601.

Problems of Neutrality Growing out of the Present War. *Johns Hopkins Alumni Magazine*, March, 1915, pp. 180-194.

Review of Charles Francis Adams' "Trans-Atlantic Historical Solidarity." *Am. Hist. Rev.*, July, 1914, pp. 912-913.

Review of W. A. Phillips' "The Confederation of Europe, A Study of the European Alliance, 1813-1823, as an Experiment in the International Organization of Peace." *Am. Pol. Sci. Rev.*, February, 1915, pp. 163-166.

Review of Sir Thomas Barclay's "Thirty Years. Anglo-French Reminiscences (1876-1906)." *Am. Pol. Sci. Rev.*, May, 1915, pp. 405-6.

Briefer reviews of Hamilton's "Reconstruction in North Carolina," Lynch's "Facts of Reconstruction," Williams' "Life of Rutherford B. Hayes," and Strunsky's "Abraham Lincoln," in *Am. Pol. Sci. Rev.*, May, 1915, pp. 344-345.

Ralph V. D. Magoffin.

The Teaching of Roman History. *The History Teacher's Magazine*, vol. 7, No. 7, September, 1914, pp. 209-218.

The Modern Making of Ancient History. *Classical Journal*, vol. 10, No. 2, November, 1914, pp. 63-71.

Latin Inscriptions at the Johns Hopkins University, VIII. Joint author with H. L. Wilson, deceased. *Amer. Journ. of Philology*, vol. xxxv, 1914, pp. 421-434.

Review of W. S. Ferguson's "Greek Imperialism." *Amer. Pol. Sci. Rev.*, vol. viii, 1914, pp. 112-113.

Review of Tenney Frank's "Roman Imperialism." *Amer. Pol. Sci. Rev.*, vol. viii, 1914, pp. 691-694.

Review of S. O. G. Douglas' "A Theory of Civilization." *Classical Weekly*, vol. vii, February 6, 1915, pp. 117-118.

Review of C. Barbagallo's "Un Semestre d'Impero Repubblicano. Il governo di Galba." *Amer. Jour. of Philology*, vol. xxxvi, 1915, pp. 115-116.

Review of J. C. Stobart's "The Glory that was Greece," "The Grandeur that was Rome." *Art and Archaeology*, vol. i, No. 6, 1915, p. 262.

In the Studies in Historical and Political Science the following numbers have been issued by this department:

"Colonial Trade of Maryland, 1689-1715." By Margaret S. Morris.

"Money and Transportation in Maryland, 1720-1765." By C. P. Gould.

"The Financial Administration of the Colony of Virginia." By P. S. Flippin.

The lectures on the Albert Shaw Foundation delivered in April, 1914, by Professor Frank A. Updyke, of Dartmouth College, have been issued by the Johns Hopkins Press under the editorial supervision of Professor Latané, under the title "The Diplomacy of the War of 1812." Pp. x, 494.

JOHN H. LATANÉ,
Professor of American History.

POLITICAL ECONOMY

The instruction in Political Economy was directed by Professor Hollander, who met students daily in seminary organization for formal study and for co-operative research. The courses were designed to afford systematic instruction in general economic principles, intimate acquaintance with special fields of economic activity, and, most important of all, knowledge of and ability to employ sound methods of economic research. Dr. George E. Barnett, Professor of Statistics, and Dr. N. R. Whitney, Instructor in Political Economy, assisted in the conduct of the work.

Economic Seminary. The students following political economy as a principal subject for the degree of Doctor of Philosophy met weekly under the direction of Professors Hollander and Barnett. The work of the year centered in the investigation of representative forms of industrial development in the United States, and in the analysis of significant activities of American labor organizations. The material resources available for the inquiry were supplemented by the continued generosity of the donor whose original gift made its inception possible. The papers and reports presented to the Seminary were as follows: "An Introduction to Fauquier's Essay on Ways and Means," by Professor Hollander; "The Introduction of the Machine in the Glass Bottle Trade," by Professor Barnett; "The Small Shop and the Organizability of Labor," by W. O. Weyforth; "The Extent of Organization in the United States in 1910," by Dr. Leo Wolman; "Unemployment Among the Bridge and Structural Iron Workers,"

by D. P. Smelser; "Minimum Wage Legislation," by Rev. John O'Grady; "Conciliation in Canada Under the Industrial Disputes Investigation Act," by J. N. Stockett; "Collective Bargaining in the Iron and Steel Industry," by J. S. Robinson; "The Attempt to Organize the Employees of the United Railways of Baltimore," by W. F. Geissel; "The Sonneborn Strike," by A. Thalheimer; "Double Liability of Shareholders in the National Banking System," by K. Simpson; Copeland's "Cotton Manufacturing Industry of the United States," by Broadus Mitchell; "The Large Business and the Organizability of Labor," by W. O. Weyforth; "Unemployment in the Building Trades Unions," by D. P. Smelser; "The National Metal Trades Association," by Professor Barnett; "The Technical Nature of the Trade and the Organizability of Labor," by W. O. Weyforth; "The Relation of the Chesapeake and Potomac Telephone Company to Its Employees," by J. O. Martin; "The Standardization of Railway Wages," by J. N. Stockett; "The Regulation of Working Conditions in the Iron and Steel Industry," by J. S. Robinson; "The Present Extent and Ownership of Standing Timber in the United States," by H. F. Holtzclaw; "The Establishment of Early Cotton Mills in North and South Carolina," by Broadus Mitchell; "Old-Age Pensions in the International Typographical Union," by W. F. Geissel; "The Extension of Corporation Finance to Mercantile and Manufacturing Business Units," by K. Simpson; "Objections and Answers to Minimum Wage Legislation," by Rev. John O'Grady; "A Plan for a National Board of Mediation and Arbitration," by Professor Barnett; "Agencies and Methods of Organizing," by W. O. Weyforth; "The Distribution of Employment," by D. P. Smelser; "The Workmen's Compensation Act of Maryland," by A. R. Gminder; "An Unnoticed Irish Edition of the 'Wealth of Nations,'" by E. T. Fell; "The Payment of the International Balance Between Japan and the United States," by Masuyo Chinda; "Two Physician-Economists: Sir William Petty and Francois Quesnay," by Professor Hollander.

Appreciable progress has also been made by members of the Seminary in the study of special aspects of the several questions assigned for investigation. During the summer field work was carried on in various carefully selected localities, and the data thus collected have since been supplemented and corrected by documentary study and personal interview.

PUBLICATIONS

Publications by members of the department during the year were as follows:

J. H. Hollander.

The Abolition of Poverty. Houghton Mifflin Company, 1914.

[with others] *Introduction to the Industrial Survey of Baltimore.* Baltimore, 1915.

Two Physician-Economists: Sir William Petty, 1623-1687; Francois Quesnay, 1694-1774. *Bulletin of the Johns Hopkins Hospital*, 1915.

Review of S. N. Patten, "Reconstruction of Economic Theory." *American Economic Review*, June, 1914, pp. 350-351.

Review of Dupin, "Oeconomiques." *American Economic Review*, December, 1914, pp. 865-867.

G. E. Barnett.

Review of Cole, "The World of Labour: A Discussion of the Present and Future of Trade Unionism." *American Economic Review*, vol. iii, June, 1914, pp. 396-7.

Review of Marot, "American Labor Unions." *American Economic Review*, vol. iv, March, 1915, pp. 94-5.

Professor Hollander served as a member of the Pan-American Financial Conference held in Washington in May, 1915, and was designated Chairman of the Sub-Section Committee on Finance of the Pan-American Scientific Congress.

Professor Barnett continued throughout the year to direct an investigation into trade unions and collective bargaining in the United States for the U. S. Commission on Industrial Relations.

Subscriptions are invited by the Johns Hopkins Press to a fourth series of reprints of economic tracts, to be issued under the editorial direction of Professor Hollander. The four important economic essays of the seventeenth century selected are: "A Treatise of the Canker of England's Common Wealth," by Gerrard de Malynes (London, 1601); "A Discourse of Trade, from England unto the East Indies," by Thomas Mun (London, 1621); "The Treasure of Traffike," by Lewes Roberts (London, 1641); and "Brief Observations Concerning Trade and Interest of Money," by Josiah Child (London, 1668).

Professor Hollander conducted the following courses of lectures:

1. The Development of Economic Theory. *Two hours weekly during the year.* A critical study was made of the doctrines of the minor economists of the English classical period, with particular attention to their positive contributions to the body of economic opinion.

2. Public Finance. *Two hours weekly during the year.* The history and theory of municipal finance were studied, with particular attention to the present fiscal problems of American cities.

Professor Barnett lectured during the year on the theory of banking and on the essential features of modern banking systems.

Dr. Henry J. Harris, Chief of the Division of Documents of the Library of Congress, delivered a course of lectures on "Workmen's Compensation Legislation."

Miss Josephine Goldmark, Publication Secretary of the National Consumers' League, delivered one lecture on "Fatigue and Efficiency."

A reading class was organized and successfully conducted by the more advanced students of the department for the co-operative study of economic texts and for the critical discussion of current literature.

The Seminary collections of economic texts was strengthened by purchases from the Hutzler fund, the McPherson fund and the Glenn fund.

Further progress was made during the past year in the collection of trade-union documents. The Seminary is now in receipt of all important trade-union journals, proceedings of conventions, constitutions, and similar publications. Through purchase and gift the

collection has been augmented by the addition of similar printed material of earlier years, and notably by the addition of complete files of the publications of certain old unions hitherto unrepresented. These additions have made accessible to students of trade-unionism in the United States a larger amount of documentary material than is to be found in any other place.

Professor Hollander, Professor Barnett, and Dr. Whitney conducted the following undergraduate courses:

Political Economy I. *Three hours weekly, through the year.* In the first half-year the industrial development of England and the United States was studied. In the second half-year systematic instruction was given in the elementary principles of economic science.

Political Economy II. *Three hours weekly through the year.* In the first half-year the theory and practice of finance were considered. In the second half-year the principles of monetary science were taught.

Political Economy III. *Three hours weekly, through the year.* In the first half-year the theory and methods of statistics were studied. In the second half-year instruction was given in advanced economic theory.

The prime purpose of the Department of Political Economy is to train qualified students in methods of economic research so that either as teachers or as investigators they may add to the sum of human knowledge in the field of economic relations. It is believed—and this constitutes the distinctive characteristic of economic study at Johns Hopkins—that this training can only be successfully given by the student's coming into immediate contact, through observation and interview, under proper guidance, with actual economic facts. A quasi-historical study based exclusively upon documentary materials and library apparatus will not afford this training. The student must be trained to investigate and understand the actual working of an existing economic institution.

The successful conduct of economic instruction of this kind requires the use of a Research Fund, comparable to the laboratory appropriations available in the natural sciences. It is required to some extent for the collection of documentary material essential to such investigations, but lying beyond the range of ordinary library purchases. The larger occasion for such a fund is, however, to enable the students at a certain period in their training to continue their investigations by actual field work, this involving repeated visits to and frequent residence in the particular localities where the phenomena under investigation are found in typical form. Without the aid of such a fund the ordinary student is practically obliged to limit his inquiry to a local phenomenon or to remain content with an imperfect induction.

JACOB H. HOLLANDER,
Professor of Political Economy.

POLITICAL SCIENCE

The work in Political Science has been directed by Professor Willoughby, and has had for its primary purpose the preparation of advanced students for professional and original work in the fields of constitutional law, international law and diplomacy, and political theory. The instruction has also aimed to supply a training for students desiring to enter the higher branches of the public service, as well as to furnish a philosophical equipment to those who expect later to pursue the study and practice of the law.

Professor Willoughby has continued to act as the Managing Editor of *The American Political Science Review*, now in its ninth volume.

Seminary and Journal Club. A weekly Seminary and Journal Club was held, devoted to the consideration of dissertation reports, the discussion of current questions in constitutional and international law, and the review of scientific treatises in the field of political science. The reports which were presented by the students dealt mainly with questions of international law, diplomacy, and political theories involved in the present European war.

Professor Ernst Freund, of the University of Chicago, gave a course of six lectures on "The Principles of Legislation."

Professor James W. Garner, of the University of Illinois, gave a course of four lectures on "The French Administrative System."

Professor Willoughby gave the following lecture courses:

1. United States Constitutional Law (in continuation of the course given in 1913-1914). *Two hours weekly, through the year.*
2. Political Theories in France Since 1750. *One hour weekly, first half-year.*
3. Political Theories in England Since 1688. *One hour weekly, second half-year.*

Dr. J. B. Scott gave the following lecture courses:

1. The Rights and Duties of Nations Considered as Members of the International Community. *One hour weekly through the year.*
2. The Principles and Practice of Diplomacy. *One hour weekly through the year.*

PUBLICATIONS

W. W. Willoughby.

Introductory Essay to the English Translation of Brissaud's History of the French Public Law. Little, Brown & Co., 1915.

The Problem of a Law School at Hopkins. *The Hopkins Alumni Magazine*, January, 1915.

Cyclopedia of American Government. Thirty-five articles in the field of United States Constitutional Law. Appleton, 1915.

Lindsay Rogers (Fellow).

State Legislation Under the Webb-Kenyon Act. *Harvard Law Review*, January, 1915.

Government by Commission. *Case and Comment*, April, 1915.

The Power of the State Over Commodities Excluded by Congress from Interstate Commerce. *Yale Law Journal*, May, 1915.

President Wilson's Neutrality: An American View. *The Contemporary Review*, May, 1915.

The War and the English Constitution. *The Forum*, July, 1915.

A. C. Millsbaugh.

Points of Emphasis in Teaching Government in the West. *The History Teachers' Magazine*, February, 1915.

Y. B. Mirza.

The Possibility and Peril of A Holy War. *The Outlook*. November 18, 1914.

In submitting this report of the work in Political Science during the academic year 1914-1915, it may be proper to add a few words with regard to what would appear to be the most urgent needs of the department if it is to increase its work and influence.

First of all, it would seem to be imperative that provision be made for undergraduate instruction in Political Science. It may be possible for the present head of the department to furnish a certain amount of undergraduate instruction, but if there is to be adequate undergraduate teaching, an instructor must be provided. Such an instructor, if appointed, might also give at least one graduate course and assist in the work of the Political Science Seminary.

Upon the graduate side there is urgent need: (1) that there be established a chair of Government and Administration; and (2) that instruction in International Law be placed upon a more definite and permanent basis.

An inspection of the titles of the graduate courses now being offered will show that no provision whatever is made for systematic instruction in that great branch of Political Science which has to deal with forms of governmental organization (central and local, national and colonial) and the problems involved in their effective administration. These are questions of the greatest scientific as well as of practical interest, and it is most unfortunate that they do not receive adequate consideration in this University.

As regards International Law and Diplomacy, it may be said that the generosity of a friend of the University has permitted provision to be made for two hours a week graduate instruction by Dr. James Brown Scott. It is understood that this gift will not be continued, and it is therefore necessary that some permanent provision be made for at least one graduate course in this field. If an instructor were added to the staff of the department, it is possible that he could give this course. Or an appropriation could be made in the University budget in order that Dr. Scott's lectures may be continued.

W. W. WILLOUGHBY,

Professor of Political Science.

PHILOSOPHY AND EDUCATION

PHILOSOPHY

After twenty-six years of service as Professor of the History of Philosophy, Dr. Edward H. Griffin at the close of the academic year retired from active duties in the department, as well as from the deanship of the college faculty. This is not the place for a review of Dr. Griffin's services to the University and to the department of philosophy; but it may be permitted here to give some expression to the regret with which the colleagues whose work has been most closely associated with his find themselves deprived of his counsel and co-operation.

Through Dr. Griffin's generosity the department library has recently been increased by nearly three hundred volumes, partly books from his private library, but chiefly new purchases designed to fill gaps in the University's equipment for the study of certain branches of the history of philosophy. At the request of the department, and by direction of the Library Committee, these volumes will be designated "The Griffin Collection," and will bear a suitable book-plate.

Provision for carrying on the undergraduate courses has been made by the appointment of Dr. Henry Slonimsky as instructor in philosophy. Dr. Slonimsky has studied at Haverford College and the University of Pennsylvania, and was during the years 1905-1912 engaged in philosophical study in Germany, chiefly at the Universities of Berlin and Marburg. He took the degree of doctor of philosophy *magna cum laude* at the latter university in 1912. He was lecturer in philosophy in Columbia University during the academic year 1914-1915. He has published *Heraklit und Parmenides* (Giessen, 1912), and various articles on æsthetic subjects in German magazines.

Besides giving the undergraduate courses in the history of philosophy and in logic—including a section in the latter subject for engineering students at Homewood—Dr. Slonimsky will collaborate in the work of the Seminary in the Philosophy of Kant.

EDUCATION

The Educational Seminary has been conducted by Professor Buchner. The work of the year included attention to the new field of educational measurement particularly in its recent developments in the form of the school survey. The topics presented included the traits of school surveys, and special reports on the method, the findings, and the recommendations peculiar to the Baltimore, Bridgeport, Portland, Springfield (Ill.), Vermont, Ohio, and New York City inquiries. The leading purpose of the studies was to discover any substantial contributions to our knowledge of education.

The course of lectures on Educational Psychology continued the study of the preceding year on the mental characteristics of adolescence and the psychology of high school activities centering in instruction and pupil progress.

Professor Buchner continued his visits to Maryland public high schools and to county institutes. At the joint institute of St. Mary's, Prince George's, and Montgomery County teachers, he delivered two series of lectures, of five each. He also addressed the annual meeting of the Maryland High School Teachers' Association, held on November 21. He was one of the University's representatives at the organization of the National Association of Municipal Universities in Washington, D. C., November 11, and also attended the annual meeting of the Southern Association of Colleges and Preparatory Schools, of which the University has become a member, at Charlottesville, Va. During the year he served as the President of the Maryland State Teachers' Association.

During the year, the Trustees of the University, acting upon the recommendation of the Departmental Committee and the Academic Council, provided for the division of the department of Philosophy and Education into two separate departments, of Philosophy and Education, respectively, at the beginning of the next academic year. Professor Buchner will hereafter have the title of Professor of Education.

GRADUATE CONFERENCE

- Jan. 22. K. Dunlap: "Feeling and Thought from a Realistic Standpoint."
Feb. 23. Mrs. C. L. Franklin: "The Meaning of Existence."
May 8. F. J. E. Woodbridge, of Columbia University.

UNDERGRADUATE COURSES

1. Undergraduate courses in Logic and Ethics were conducted by Professor Griffin and a course in Psychology by Associate Professor Dunlap. By special arrangement, a series of lectures in Political Science was given by President Goodnow as a part of this course, which is required of all candidates for the degree of Bachelor of Arts.

The several subjects were distributed through the year as follows: Deductive and Inductive Logic, October 6th till December 16th; Psychology, January 4th till March 8th; Constitutional Government, March 8th till April 30th; Ethics, May 1st till June 1st.

A course in the Outlines of the History of Philosophy was conducted by Professor Griffin.

2. In the College Courses for Teachers, a course on the History of Education and one on the Principles of Education, each meeting two hours a week through the year, were given by Professor Buchner.

In the same group of courses, Associate Professor Dunlap conducted two courses in Psychology, each meeting two periods a week, one in Introductory Human Psychology, and the other an experimental course consisting of two laboratory periods a week.

PUBLICATIONS

E. F. Buchner.

The 1914 Summer Courses of the Johns Hopkins University. *Forty-Eighth Annual Report of the Department of Public Education of the State of Maryland*, Baltimore, 1914, 131-137.

The Nineteen-Fourteen Summer Courses. *The Johns Hopkins Alumni Magazine*, 1915, iii, 115-120.

School Surveys. In *Report of the United States Commissioner of Education* for the year ending June 30, 1914, Chap. xxiv, Vol. i, 513-562.

Johns Hopkins University (as an urban University). In *The University and the Municipality*; Proceedings of the First Session of the National Association of Municipal Universities. U. S. Bureau of Education, Bulletin No. 38, 1915, 50-52.

"Suggestions to High School Teachers." (Editor). Johns Hopkins University Bulletin, 1915.

A. O. Lovejoy.

A National Association of University Professors. *The Nation*, vol. 99, 1914, p. 580.

Organization of the American Association of University Professors. *Science*, n. s., vol. 41, 1915, pp. 5-8.

Report of the Committee of Inquiry of the American Association of University Professors on Conditions at the University of Utah (with E. R. A. Seligman and others), 1915, pp. 82.

Review of Holt's "The Concept of Consciousness." *Philos. Rev.*, 1914, pp. 664-677.

Review of Kallen's "William James and Henri Bergson." *The Nation*, vol. 100, 1915, pp. 388-390.

Review of Thilly's "History of Philosophy." *Jour. of Philos., Psych., and Scientific Methods*, vol. 12, 1915, pp. 272-7.

The Vaticinations of Professor Usher (Review of Usher's "Pan-Americanism"). *The Nation*, vol. 101, 1915, pp. 16-17.

A German Made, not Born (Review of Chamberlain's "Immanuel Kant"). *The Nation*, vol. 101, pp. 261-2.

Review of Rose's "The Origins of the War." *The Nation*, vol. 101, p. 295.

German Scholars and "Truth About Germany." *The Nation*, vol. 99, 1914, pp. 376-7.

The Professional Landsturm. *The Nation*, vol. 99, 1914, pp. 656-7. (French tr. in "Voix Américaines sur la guerre de 1914-15," Paris, 1915, pp. 54-9.)

Reply to Professor Darmstaedter. *The Nation*, vol. 100, 1915, pp. 195-6.

What Was the *Casus Belli*? *The Nation*, vol. 100, 1915, pp. 246-7.

EDWARD F. BUCHNER,
Secretary.

PSYCHOLOGY

During the year 1914-1915 advanced courses in the Psychology of Learning and in the Behavior of Vertebrates were conducted by Professor Watson. Associate Professor Dunlap gave courses in Introductory Experimental Psychology and research courses in Experimental Psychology, and met the fourth-year class of undergraduates, for three months, for an elementary course in psychology.

THE MORE IMMEDIATE NEEDS OF PSYCHOLOGY

On account of the very limited space which is available for animal work in the Biological Building, it has not been possible for psychology to carry out many important problems which ought to be developed here. Even with the facilities at hand we have made important contributions on such practical problems as the factors which enter into the acquisition of skill, such as the effects of distribution of practice, age, punishment and reward, etc., and upon the effects of drugs and other agents both upon the acquisition of skill and the exercise of skill. But such investigations as we have carried out are merely preliminary. We have been handicapped, both by the lack of space for housing and breeding our animals, and of adequate apparatus as well. On the less practical but equally important theoretical side we have felt similarly such limitations. We have a wide series of problems dealing with the responses of animals to light, sound, and other stimuli, and on the effect of excision of certain parts of the central nervous system (localization of function), which must await more adequate space for the animal work, and a better equipment. The need of a small operating room is especially felt in this connection.

Coming to the human side, there are two pieces of apparatus which would be of very great assistance to us. We have been trying to develop vocational psychology here, and we are especially handicapped, so far as practical experimentation goes, by the lack of a good moving-picture outfit. Even if we could get the camera and lantern for the moving-picture work, we would have to have a fund for the purchase and development of the films—both expensive items. The need of this outfit can be very easily understood. A moving-picture record is essential in solving so simple a problem as to whether there are waste motions in the work of a given operator. Experiments on efficiency are just beginning. In our field such work is wholly experimental. The photographic registration of the subject's method of work is the first desideratum. I will not dwell on this subject further than to say that a moving-picture outfit is necessary for almost any kind of vocational work.

Many of our more advanced problems in human psychology have had to be put aside until we can get a string galvanometer. One of the most difficult problems we have in the laboratory is to get objective records of delicate bodily movements—as in the study of the emotions and thought processes. Only a few days ago we had to give up a very important piece of work because the continuation of it was dependent upon such an instrument as a string galvanometer.

During the past eight years we have purchased only such apparatus as we have been actually forced to buy. Since our classes have been

small, it has been possible for us to get along and do thoroughly scientific work; in other words, our laboratory has been devoted almost wholly to research work and very little to instruction. On account of the change which was last year introduced into the curriculum, it will be necessary for us to give an undergraduate course in experimental psychology. To do this work most advantageously and at the same time to maintain the standards in the work already being done, we should have an additional instructor as well as an increased appropriation for apparatus.

PUBLICATIONS

John B. Watson.

Studies on the Spectral Sensitivity of Birds. *Carnegie Publications*, No. 211, 85-104.

Edited *Psychological Review*, 1914.

Edited *Animal Behavior Monographs*, 1914.

John B. Watson with K. S. Lashley.

An Historical and Experimental Study of Homing. *Carnegie Publications*, No. 211, 7-60.

Knight Dunlap.

An Outline of Psychobiology. *The Johns Hopkins Press*, 1914. pp. 121; 77 illustrations.

Muscular Activity and Thought Processes. *Scientific American Supplement*, 1914, lxxvii (2039), 322-323.

A New Measure of Visual Discrimination. *Psychological Review*, 1915, xxii, 28-35.

The Shortest Perceptible Time-Interval Between Two Flashes of Light. *Psychological Review*, 1915, xxii, 226-249.

K. S. Lashley.

Notes on the Nesting Activities of the Noddy and Sooty Terns. *Carnegie Publications*, No. 211, 61-84.

The Acquisition of Skill in Archery. *Carnegie Publications*, No. 211, 105-128.

A Note on the Persistence of an Instinct. *Journal of Animal Behavior*, 1914, 4, 293-294.

Recent Literature of a General Nature on Animal Behavior. *Psychological Bulletin*, 11, 269-277.

Reproduction of Inarticulate Sounds in the Parrot. *Journal of Animal Behavior*, 3, 361-366.

Recent literature on Sensory Discriminations in Animals. *Psychological Bulletin*, 12, 291-299.

Helen B. Hubbert.

Elimination of Errors in the Maze. *Journal of Animal Behavior*, 5, 66-72.

John L. Ulrich.

Distribution of Effort in Learning in the White Rat. *Behavior Monographs*, 10, pp. iii + 51. 1915.

JOHN B. WATSON,
Professor of Psychology.

REPORT ON THE COLLEGE COURSES FOR TEACHERS

TO THE PRESIDENT OF THE UNIVERSITY:

I have the honor to submit the following report on the work of the College Courses for Teachers, conducted in coöperation with Goucher College, during the academic year, October 13, 1914, to May 29, 1915.

This is the sixth year of these courses, the plans for which are stated in detail in the *University Circular* of May, 1914. Of the courses announced, instruction of standard collegiate grade was given in the following: Education I and II; English I, II, and III; French I, II, and III; German III; History (Renaissance and Reformation); Hygiene; Political Economy, and Psychology I and II. Owing to the small registration, the courses announced in Chemistry, German I and II, Italian, Latin, Mathematics and Spanish were withdrawn. In response to a request on the part of a group of teachers of ungraded classes, presented in December, a special course of lectures and clinical demonstrations on the "Sub-normal Child and its Training" was given by Dr. C. Macfie Campbell, at the Phipps Psychiatric Clinic, from February 6th to April 10th, inclusive. The large registration in this course, which received no public announcement, indicates that it was meeting an important need in our community. These courses were conducted by twelve instructors, three of whom were members of the staff of Goucher College, the remainder of the University.

During the year 1913-14, the central social agencies in the city, sensing the need of further training on the part of those engaging in social service, appealed to the University and the College to provide, if possible, a program of courses of instruction which would be of special service to social workers. This request was presented to the Committee, in the hope that this provision might be made in connection with these courses. The program provided for this purpose included a modification of a course in education and a course in psychology, and the addition of one course in hygiene and one course in political economy. The fairly satisfactory response to the opportunity of pursuing these subjects indicates unmistakably a new field of service which is at hand in this direction.

The enrolment in the courses was one hundred sixty-five the first half-year, and one hundred sixty-nine the second half-year, the total enrolment for the year being one hundred eighty-nine students, nine of these being duplicate registrations from other departments, four medical, three graduate, and two undergraduate. The primary registration of the year was one hundred eighty. Twenty-four were men and one hundred sixty-five were women. Of the one hundred sixty-seven students registered in the courses last year, sixty continued their registration this year. The occupational distribution of the persons registered is as follows: Teachers and those in preparation for teaching, 118; no occupation, 26; social

workers, 19; students, 11; stenographers, 4; librarians, 3; lawyers, 3; clergymen, 2; dentist, 1; insurance agent, 1; physician, 1.

The conference of the presidents and deans of the two institutions, with the instructors in these courses, was held on April 24, 1915. The report made by the latter on the character and scope of the work done by their students indicated that it continued, as during the five years passed, to maintain the standards required in the regular collegiate classes in the two institutions. The following amounts of credit for the courses were recommended and authorized: Education I, three hours; Education II, three hours; English I, three hours (for a grade of eight or more), two hours (for a grade of six or less than eight); English II, three hours; English III, three hours (for a grade of eight or more), two hours (for a grade of six or less than eight); French I, four hours; French II, three hours; French III, three hours; German III, three hours; History, three hours; Hygiene, two hours; Political Economy, three hours; Psychology I, one and a half hours; Psychology II, two hours. In view of the fact that no examinations were taken by students in the course on the Sub-normal Child and its Training, the question of credit in this course was not considered. It was voted that all credits recommended be made a matter of permanent record in the office of the Registrar.

Under the plan of management of the courses, the University still has a small deficit to carry. In view of the increased usefulness of the work undertaken by the students and the enlarging fields of community service, the Committee has elaborated a program of twenty-four courses for the year 1915-16.

EDWARD F. BUCHNER,
Chairman.

REPORT OF THE DIRECTOR OF THE SUMMER COURSES

TO THE PRESIDENT OF THE UNIVERSITY:

I have the honor to present the following report of the fifth session of the Summer Courses of the University, which was held during the six weeks from July 5th to August 12th, 1915.

In the preparation and perfection of the plans for the session, the University had the benefit of wider coöperation with other agencies than in former years. The assistance of State, City and County Superintendents of Schools was freely continued in the selection of helpful material in the courses for teachers. The Carnegie Foundation for International Peace placed this University upon its list of institutions in whose summer sessions it maintained this year for the first time, by gift, courses in the subjects of history, international law and Spanish in their relations to American and international affairs. Two courses for the training of leaders in playground and other recreational activities were offered in coöperation with the Children's Playground Association of Baltimore, Incorporated. The needs of the State of Maryland, as specified in recent legislation, defining the minimum preparation of teachers and the utilization of summer study in lieu of the annual institute, were fully recognized. The coöperation of the Board of School Commissioners of Baltimore, which has been a feature of the Summer work since the beginning, made possible the continuance of instruction in Domestic Science and Manual Training and the addition of Domestic Art. The details of the coöperation of the Peabody Conservatory of Music during the session are mentioned below.

The most marked feature of the fifth session was the addition of graduate instruction in nine departments to the instruction which had been maintained during the preceding years. Provision was made for the proper recognition of successful work in the graduate courses by candidates for the degree of Master of Arts. One of the two years of resident work required for this degree may be satisfied by attendance and study during three sessions of the summer courses. The registration of sixty-five graduate students in these courses, the majority of whom made application to be accepted as candidates for an advanced degree, was a most satisfactory response to the new effort by the University.

The scope of the instruction offered included a total of seventy courses in the seventeen subjects listed below. Domestic Art, Playground and Recreation, and Psychology, were the subjects offered for the first time. In continuing the practice of former years, which involved new material, particularly in the graduate courses, thirty-six new courses, one-half of the program offered, were made available as follows: three in Chemistry, two in Domestic Art, four in Educa-

tion, four in English Literature, one in French, three in German, three in History, two in Latin, three in Mathematics, three in Physics, two in Playground and Recreation, two in Politics, three in Psychology, and one in Spanish. Of the courses announced, Physics 3, Playground and Recreation 2, and Spanish 1 were not given; while an unannounced course in Calculus and one in Embryology were arranged at the opening to meet special needs.

The persons appointed to give instruction were as follows:

Biology	2 courses.
Asa A. Schaeffer, Instructor in Summer Courses.	
Chemistry	6 courses.
J. Elliott Gilpin, Professor.	
Benjamin F. Lovelace, Associate Professor.	
M. B. Hopkins, Laboratory Assistant.	
Domestic Sciences and Art	5 courses.
A. Grace Johnson, Instructor in Summer Courses.	
Grace E. Russell, Instructor in Summer Courses.	
Education	12 courses.
Bird T. Baldwin, Instructor in Summer Courses.	
Anna Brochhausen, Instructor in Summer Courses.	
Clarence G. Cooper, Instructor in Summer Courses.	
William J. Holloway, Instructor in Summer Courses.	
Edith Anne Lathrop, Instructor in Summer Courses.	
Leahora A. Taft, Instructor in Summer Courses.	
Henry S. West, Instructor in Summer Courses.	
English Composition	4 courses.
Robert L. Ramsay, Instructor in Summer Courses.	
Willis H. Wilcox, Instructor in Summer Courses.	
English Literature	4 courses.
Alfred Allan Kern, Instructor in Summer Courses.	
Robert L. Ramsay, Instructor in Summer Courses.	
French	3 courses.
Gustav Grünbaum, Instructor.	
German	5 courses.
Robert B. Roulston, Associate.	
Henry Wood, Professor.	
History	5 courses.
John H. Latané, Professor.	
Herbert C. Lipscomb, Instructor in Summer Courses.	
William Starr Myers, Instructor in Summer Courses.	
Latin	2 courses.
Herbert C. Lipscomb, Instructor in Summer Courses.	
Manual Training	3 courses.
George M. Gaither, Instructor in Summer Courses.	
Mathematics	4 courses.
Arthur Byron Coble, Associate Professor.	

Physics	6 courses.
John August Anderson, Associate Professor.	
Clarence W. Hewlett, Assistant.	
Playground and Recreation	2 courses.
John L. Clarke, Instructor in Summer Courses.	
Mary E. Gross, Instructor in Summer Courses.	
Politics	2 courses.
John H. Latané, Professor.	
William Starr Myers, Instructor in Summer Courses.	
Psychology	3 courses.
Knight Dunlap, Associate Professor.	
Spanish	2 courses.
F. Courtenay Tarr, Instructor in Summer Courses.	

Eleven of the instructors and assistants were members of the University. To these were added the following representatives of other institutions and school systems: Professor Bird T. Baldwin, of Swarthmore College; Principal Anna Brochhausen, of the Indianapolis Public Schools; Mr. John L. Clarke, of the Public Athletic League of Baltimore; Mr. Clarence G. Cooper, Supervisor of Rural Schools of Baltimore County, Maryland; Mr. George M. Gaither, Instructor and Supervisor in the Baltimore Public Schools; Miss Mary E. Gross, Supervisor of the Children's Playground Association of Baltimore; Miss A. Grace Johnson, Supervisor of Domestic Science and Art of Kokomo, Indiana; Professor Alfred Allan Kern, of Millsaps College; Assistant Superintendent Edith Anne Lathrop, of Nebraska; Professor Herbert C. Lipscomb, of Randolph-Macon Woman's College; Assistant Professor William Starr Myers, of Princeton University; Associate Professor Robert L. Ramsay, of the University of Missouri; Professor Grace E. Russell, of the Iowa State College of Agriculture and Mechanic Arts; Associate Professor Asa A. Schaeffer, of the University of Tennessee; Superintendent Leonora A. Taft, of Woodstock, Vermont; Dr. Henry S. West, of the University of Cincinnati; Professor Willis H. Wilcox, of the Maryland State Normal School. The work in Spanish was conducted by F. Courtenay Tarr *vice* Dr. A. M. Soho, who was compelled to resign from the staff, on account of illness, just prior to the opening of the session. Owing to an incapacitating illness which overtook Clarence G. Cooper during the second week, his courses were continued by William J. Holloway, Superintendent of Schools, of Wicomico County, Maryland. It is a special pleasure to be able to report that the success of the session was due, in large measure, to the lively interest and generous coöperation which all of the instructors contributed day by day to the full realization of the plans which the University had matured for the session. The enthusiasm of the teachers of our summer students may well be looked upon as an unflinching index of the thorough quality of the work of the students.

The enrolment numbered four hundred twenty-eight. Of these, one hundred thirty, or 30 per cent., were men, and two hundred ninety-eight, or 70 per cent., were women. The total number of course registrations was one thousand fifty-three, the average number of courses taken per student being 2.41. The distribution of

these elections was as follows: One course was taken by sixty students; two courses, by one hundred thirty-four; three courses, by two hundred twenty-eight, and four courses, by six. Three hundred twenty-two, or 75.2 per cent, of the students were administrative and supervisory officers or teachers in colleges, normal schools, public, and private schools. Sixty-eight, or 15.9 per cent., were students in colleges and secondary schools. Fourteen, or 3.3 per cent., represented fifteen other occupations, and twenty-four, or 5.6 per cent., were engaged in no occupations. Sixty-six, or 15 per cent., held academic or professional degrees from forty-three institutions. The geographical distribution of the students was as follows: Maryland was represented by three hundred sixty-three, of whom two hundred fifty-eight, or 60 per cent. were from the counties, and one hundred five, or 25 per cent., from Baltimore City; sixteen other states, the District of Columbia, and one foreign country, by sixty-five, or 15 per cent. Each of the twenty-three counties in Maryland was represented among the student body.

Subjects and Courses	Hours of Credit	Enrolment	Number Taking Examinations
Biology			
Botany	1½	10	7
Zoology	1½	7	7
Embryology		1	1
Chemistry			
Organic Chemistry	Grad.	11	8
The Principles of Analytical Chemistry ..	Grad.	9	8
Inorganic Reactions and Inorganic Preparations	Grad.	1	1
Quantitative Analysis	Grad.	5	5
Household Chemistry	2	7	5
Introduction to General Chemistry	2½	17	7
Domestic Science and Art			
Elementary Cookery	1½	17	13
Advanced Cookery	1½	5	4
Methods of Teaching Domestic Science ..	1	8	8
Elementary Clothing and Hand Work	2	8	7
Drafting, Draping and Costume Design	1½	8	7
Education			
The Administration of Secondary Education	Grad.	11	10
Adolescence	Grad.	15	12
Secondary School Teaching	Grad.	22	18
Principles of Education	Grad.	17	14
The Elementary School: Grammar Grades ..	1½	31	20
The Elementary School: Primary Grades ..	1½	57	45
The Teaching of English and History in the Elementary School	1½	95	66
The Teaching of Arithmetic and Geography in the Elementary School	1½	71	54
Rural School Problems	1½	62	55
A Demonstration School, Observation Course ..	1	64	55
The Principles of Elementary Teaching ..		33	31
School Management and School Law		27	26
English Composition			
Description and Narration	1½	19	15
Expository Writing	1½	5	5
Sentence and Paragraph Structure		18	16
Elements of English Composition		35	22

Subjects and Courses	Hours of Credit	Enrolment	Number taking Examinations
English Literature			
English Literary Movements of the Present	Grad.	18	10
The Poems and Dramas of Tennyson....	Grad.	8	6
The Poems and Dramas of Browning....	Grad.	14	14
Anglo-Saxon	Grad.	2	2
French			
French Romanticism.....	1½	2	2
Readings in French.....	1½	12	8
Elementary French.....	1½	17	14
German			
Goethe's and Schiller's Later Classical Dramas	Grad.	8	7
Origin and Development of Modern German	Grad.	6	5
Advanced German.....	Grad.	8	8
Readings in German.....	1½	24	18
Elementary German.....		15	12
History			
Latin-American History and Diplomacy...	Grad.	17	13
American History, 1820-1860.....	Grad.	8	4
American History, 1781-1801.....	Grad.	16	14
English History.....	1½	7	7
Roman History.....	1½	9	5
Latin			
Tacitus, Annals.....	1½	2	2
Cicero		4	2
Manual Training			
Elementary Manual Training.....	1½	18	18
Bench Work in Wood and Mechanical Drawing	1½	8	8
Hand-work for Teachers of Backward and Defective Children.....	1	1	1
Mathematics			
Theory of Groups.....	Grad.	2	2
Theory of Functions of a Real Variable..	Grad.	1	1
The Elements of Analytic Geometry and Graphic Algebra.....	1½	9	9
The Essentials of Geometry and Algebra..		7	6
Integral Calculus.....	1½	2	2
Physics			
Spectroscopy	Grad.	4	2
Theoretical Mechanics.....	Grad.	3	2
Mechanics and Heat.....		9	8
Electricity and Magnetism.....	1½	15	14
Teachers' Course in Physics.....		6	3
Playground and Recreation			
Singing Games and Folk Dances.....		16	16
Politics			
International Law.....	Grad.	11	9
American Party Government.....	1½	7	7
Psychology			
Advanced General Psychology.....	Grad.	5	5
Experimental Psychology.....	Grad.	1	1
Introduction to General Psychology.....	1	9	7
Spanish			
Elementary Spanish.....	1½	8	5

The preceding table presents a ready survey of the work done by the students in so far as this may be gathered from a list of the courses given in the several subjects, the courses allowed academic credit, the enrolment in each, and the number taking examinations at the close of the session.

The tradition of earnest work on the part of the summer student was satisfactorily maintained throughout the session. 99.1 per cent. were entitled to certificates of attendance or examination; and 92.1 per cent. remained to complete their work by taking the examinations at the close. The two measures, available in the average number of courses taken per student, and in the number of individuals remaining to the close of the session in order to complete the requirements of the courses elected, show a steady increase in the amount of work actually done by the summer students, and are the best indications of the high degree of seriousness attending their efforts. The special appreciation by the students of the opportunities offered by the University is a most gratifying result, and should encourage further developments in this field.

The series of Friday evening lectures and entertainments of a more popular character, and Sunday afternoon organ recitals, open to the public, were made especially attractive through the cordial co-operation of the summer session of the Peabody Conservatory of Music. The series included public recitals in the concert hall of the Conservatory and lectures, each preceded by a special musical program under the direction of Mr. Frederick R. Huber, Director of the Peabody Summer School, in McCoy Hall. The programs were as follows:

- July 9—Mr. Horatio Connell, baritone, of the Conservatory.
Recital.
- July 11—Mr. Harold D. Phillips, F. R. C. O., organist of the Conservatory.
Recital. "Representative organ works of French and German Schools."
- July 13—Municipal Band and Community Singing.
- July 16—Dr. John A. Anderson, of the University.
"Photographic Views of the Heavens." (Illustrated.)
- July 18—Mr. Phillips, organist.
Lecture-recital.
- July 23—Mr. George F. Boyle, pianist, and Mr. J. C. Van Hulsteyn, violinist, of the Conservatory.
Recital.
- July 25—Mr. Phillips, organist.
Recital. "Transcriptions of works of great Masters."
- July 27—Municipal Band and Community Singing.
- July 30—Professor John H. Latané, of the University.
"The Advance of the United States in the Caribbean."
- August 6—Mr. Max Landow, pianist, and Mr. Bart Wirtz, 'cellist, of the Conservatory.
Recital.

An especially interesting series of lectures on "The History of Music" was given by Mr. Harold D. Phillips on Monday and Thursday afternoons at the Conservatory. The topics in this series were:

- July 1—(a) Early experiments in music.
(b) The foundation of Plain-song.
- July 5—Early forms of notation and polyphony.
- July 8—Folk-song.
- July 12—The Polyphonic Schools of Belgium, Italy, England.
- July 15—Beginnings of opera, oratorio, and instrumental music.
- July 19—Rise of Italian vocal school and development of instruments and instrumental forms.
- July 22—Bach and Händel.
- July 26—Instrumental music of the 18th century.
- July 29—Beethoven. Culmination of the Classic and Rise of the Romantic and Program Schools.
- August 2—Italian, French, and German Opera from the middle of the 18th to the middle of the 19th century.
- August 5—Brahms and Wagner.
- August 9—Modern developments.

The social welfare of the members of the faculty and student body received attention. The Directors gave a reception to the two faculties at the Johns Hopkins Club on Tuesday evening, July 6th. Opening and closing receptions by the University and the Conservatory were given in the Peabody Art Gallery to the faculties and students on Friday evenings, July 9th and August 6th. Saturday excursions were taken to Annapolis on July 17th, on invitation of Dr. M. Bates Stephens, State Superintendent of Education, and to Washington, D. C., on August 7th, on invitation of Dr. P. P. Claxton, United States Commissioner of Education.

EDWARD F. BUCHNER,
Director.

REPORT OF THE DEAN OF THE MEDICAL FACULTY

TO THE PRESIDENT OF THE UNIVERSITY:

I have the honor to submit the following report of the activities of the Medical Department during the year extending from October 1st, 1914 to September 30th, 1915.

The total enrollment of candidates for the degree of doctor of medicine was 360. Three students withdrew for various causes, reducing the enrollment at the end of the academic year to 357.

Upon the recommendation of the Advisory Board of the Medical Faculty, the University conferred the degree of Doctor of Medicine upon one student on February 22, 1915, and upon 89 students at the Commencement exercises held June 8, 1915.

Twenty-nine physicians registered for special instruction in various branches of medicine and surgery during the school year, and 59 physicians were enrolled for the summer courses offered to graduates in medicine during the six weeks beginning June 1st, 1915.

Two hundred and eighty-six applications for admission were received at the beginning of the 1915-16 session and ninety were accepted for the first year and eight for advanced standing. Five students were admitted with conditions: four in French and one in German.

All of the regular courses announced in the catalogue have been given. In addition to the work of instruction, the teaching staff, as well as our alumni and students, have been active contributors to medical literature, as is shown by the fact that their publications during the year ending July 1st, 1915, aggregated 736. These contributions have been collected and bound, and constitute a valuable addition to our Library.

The health of the student body during the past year has been very satisfactory. As in previous years careful physical examination was made of the 105 incoming students, ten of whom were in need of special supervision, but no one was seriously sick.

I regret to report that two of our alumni died during the year, viz. David B. Anderson (1913), May 28, 1915, and William M. Dumm (1912), July 12, 1915.

The Medical School is under renewed obligations to Mr. W. A. Marburg, one of the Hospital Trustees, for the presentation of the Jonathan Hutchinson Collection of Books and Drawings. This valuable collection was presented at the suggestion of Sir William Osler.

In May 1915 the James Buchanan Brady Urological Institute was opened with appropriate ceremonies. The opening of this department fills a much needed want for hospital accommodations and offers increased opportunity for routine instruction and research work to students and physicians desiring to perfect themselves in Urology. The institute has been amply equipped with laboratory facilities and it is expected that important researches will issue from it.

For many years lack of funds has hampered the department of Pathology and Bacteriology in the development of its bacteriological work. Through the energy of Dr. M. C. Winternitz, Associate Professor of Pathology, a fund amounting to \$7,500 a year has been guaranteed for three years, to be used for needed expansion along these lines.

Construction of the new Hunterian Laboratory has been begun. The building will be completed this spring, and will offer greatly increased facilities for experimental work in medicine, surgery and pediatrics.

The institution of the full university status in the departments of medicine, surgery and pediatrics, which was made possible by the William H. Welch Endowment for Clinical Education and Research, was put into effect during the year and has added materially to our teaching and research resources.

Unfortunately, the work in the department of pediatrics is greatly hampered by the fact that the endowment of the Harriet Lane Home is not sufficient to permit the utilization of a large number of its beds. This applies particularly to the wards intended for the treatment of infectious diseases. Increased endowment for their maintenance is urgently needed, not only for caring for the sick, but for affording suitable facilities for the instruction of medical students in this important branch of medicine.

Improvement in these three fundamental branches of medicine has accentuated the defects in many other departments of instruction. I would call particular attention to the urgent need for an Institute of Hygiene, as this subject is now inadequately cared for in a few rooms in the Pathological Laboratory. If expansion is to occur in this important field, additional funds for the erection of a building and for the endowment of the department must be forthcoming.

I would also call attention to the overcrowded condition of the departments of physiology and physiological chemistry. Both of these departments are greatly hampered by lack of space, which interferes with the routine instruction of the students, and makes impossible proper accommodation for research workers. This condition could be relieved by removing from the present building the department of pharmacology and the library. This, however, would require two additional buildings: one a Pharmacological Institute and the other a suitable library building. At present the funds are not available for either.

The department of obstetrics is greatly hampered by inadequate hospital facilities and faulty equipment for teaching. One of the great needs of the Medical School is a generous endowment for an institute planned somewhat along the lines of the Woman's Clinics in Germany, which should be upon the full time basis and should be devoted to the care of the patients, the teaching of students, and research.

During the year the following members of the teaching staff resigned:

- Dr. Herbert M. Evans, Associate Professor of Anatomy, to become Professor of Anatomy, University of California.
- Dr. Charles R. Eslick, Associate in Anatomy.
- Dr. Benjamin B. Turner, Associate in Pharmacology to become Associate Professor of Pharmacology, University in Indiana.

- Dr. Ernest W. Goodpasture, Instructor in Pathology, to become Resident Pathologist, Peter Bent Brigham Hospital, and Instructor in Pathology, Harvard Medical School.
- Dr. Holland N. Stevenson, Instructor in Pathology, to become Assistant in Cancer Research Laboratory, Columbia University, New York.
- Dr. Lloyd P. Shippen, Instructor in Bacteriology, to become Research Bacteriologist, Bureau of Chemistry, Department of Agriculture, Washington, D. C.
- Dr. James R. Miller, Instructor in Obstetrics.
- Dr. David K. Henderson, Instructor in Psychiatry, to become Senior Resident, Royal Glasgow Asylum, Scotland.
- Dr. J. Craig Neel, Instructor in Gynecology, to become Instructor in Gynecology and Obstetrics, University of California.
- Dr. Thornton Stearns, Assistant in Pathology, to become Assistant in Surgery and Resident Surgeon, University of California.
- Dr. Henry W. Cave, Assistant in Surgery, to become Assistant Resident Surgeon, Roosevelt Hospital, New York.
- Dr. LeRoy N. Fleming, Assistant in Surgery, to become Assistant Resident Surgeon, Peter Bent Brigham Hospital, Boston.
- Dr. Carl W. Waldron, Assistant in Laryngology.
- Dr. James B. Holmes, Assistant in Pediatrics.
- Dr. Oliver H. Stansfield, Assistant in Pediatrics.
- Dr. Sydney R. Miller, Assistant in Psychiatry, to become Instructor in Clinical Medicine.
- Dr. Willa M. Fricke, Assistant in Obstetrics, to become Fellow in Bacteriology, Mayo Clinic, Rochester, Minn.
- Dr. Edward Jelks, Assistant in Laryngology.

The following new appointments were made:

- Dr. Montrose T. Burrows, Associate in Pathology.
- Dr. Emil Goetsch, Associate in Surgery.
- Dr. Cecil K. Drinker, Instructor in Physiology.
- Dr. Samuel Goldschmidt, Instructor in Pathology.
- Dr. James L. Gamble, Instructor in Pediatrics.
- Dr. Warren R. Sisson, Instructor in Pediatrics.
- Dr. Charles A. Waters, Instructor in Actinography.
- Dr. Veader N. Leonard, Instructor in Actinography.
- Dr. Albert Keidel, Instructor in Clinical Medicine.
- Dr. Robert S. Cunningham, Assistant in Anatomy.
- Dr. Admont H. Clark, Assistant in Pathology.
- Dr. William C. Duffy, Assistant in Pathology.
- Dr. Calvin H. Goddard, Assistant in Medicine.
- Dr. Mildred Clark, Assistant in Medicine.
- Dr. Roger P. Batchelor, Assistant in Surgery.
- Dr. William A. Frontz, Assistant in Urology.
- Dr. Frederick W. Hobelman, Assistant in Clinical Urology.
- Dr. Henry P. Mauck, Assistant in Clinical Surgery.
- Dr. S. Shelton Watkins, Assistant in Clinical Laryngology.
- Dr. Lewie M. Griffith, Assistant in Clinical Laryngology.
- Dr. Harold L. Higgins, Assistant in Pediatrics.
- Dr. Daniel Davis, Assistant in Obstetrics.
- Dr. Marjorie D. Batchelor, Assistant in Medicine.
- Dr. Mary A. Hodge, Assistant in Clinical Medicine.
- Dr. Caroline B. Towles, Assistant in Clinical Medicine.
- Dr. Alma Rothholz, Assistant in Laryngology.
- Dr. Alma Hiller, Assistant in Medicine.

The Maryland, Virginia and North Carolina scholarships for 1914-15 were awarded as follows:

Maryland: E. Novak and B. Tappan.

Virginia: W. B. Martin and J. E. Warinner.

North Carolina: L. deK. Belden and L. H. Williams.

The Joseph Kernochan Garr Scholarship was awarded to D. W. Atchley.

The following seventeen members of the graduating class were recommended to the Trustees of the Johns Hopkins Hospital for appointment as House Officers, the recommendation being based upon excellence of scholarship throughout the medical course:

Dr. W. C. Burket.	Dr. H. H. Musser.
Dr. S. W. Clausen.	Dr. G. H. Preston.
Dr. D. F. Elmendorf.	Dr. G. K. Rhodes.
Dr. R. E. Fallas.	Dr. T. M. Rivers.
Dr. R. L. Haden.	Dr. G. W. Rosenthal.
Dr. V. R. Mason.	Dr. V. P. W. Sydenstricker.
Dr. K. F. Maxcy.	Dr. D. V. Trueblood.
Dr. J. G. Murray.	Dr. P. S. Tucker.
Dr. L. R. Wharton.	

The positions obtained by other members of this class, either by competitive examination or by personal appointment, are as follows:

F. E. Adair.—Interne, New York Hospital, New York.

H. M. Andrew.—Interne, Hartford Hospital, Hartford, Conn.

C. Armstrong.—Interne, New Haven General Hospital, New Haven, Conn.

J. Aull.—Interne, Washington University Hospital, St. Louis, Mo.

A. M. Bacon.—Interne, Garfield Memorial Hospital, Washington, D. C.

J. C. Baldwin.—Interne, St. Francis Hospital, Pittsburgh, Pa.

Marjorie D. Batchelor.—Assistant in Medicine and Dispensary Physician.

R. P. Batchelor.—Assistant in Surgery.

H. E. Bates.—Interne, Bellevue Hospital, New York.

L. C. Bean.—Interne, Union Protestant Infirmary.

L. deK. Belden.—Interne, Roosevelt Hospital, New York.

G. Braunlich.—Interne, New Haven Hospital, New Haven, Conn.

F. Christopher.—Interne, New York Hospital, New York.

A. H. Clark.—Assistant in Pathology.

J. H. Clarke, Jr.—Interne, Philadelphia General Hospital, Philadelphia, Pa.

H. D. Clough.—Interne, R. I. State Hospital, Providence.

Rena Crawford.—Interne, N. Y. Infirmary for Women and Children, New York.

R. S. Cunningham.—Assistant in Anatomy.

A. B. Dayton.—Fellow in Pathology.

B. J. Delatour.—Interne, St. Luke's Hospital, New York.

W. F. Derr.—Interne, Williamsport Hospital, Pa.

D. F. Elmendorf.—Interne, Children's Hospital School.

O. A. Faust.—Interne, Rhode Island Hospital, Providence.

H. S. Gasser.—Instructor in Pharmacology, Univ. of Wisconsin, Madison.

W. C. von Glahn.—Interne, New Haven Hospital, Conn.

- S. J. Glass.—Interne, Hospital for Women of Maryland.
 W. M. Gober.—Interne, M. E. Hospital, Brooklyn, N. Y.
 C. H. Goddard.—Assistant in Medicine.
 L. M. Griffith.—Assistant in Laryngology.
 R. Griffith.—Interne, City Hospital, Hartford, Conn.
 W. M. Happ.—Interne, City Hospital.
 V. O. Heddens.—Interne, New York Hospital, New York.
 F. M. Houck.—Interne, Cragmor Sanatorium, Colorado Springs, Col.
 M. Joseph.—Interne, Panama Canal Service.
 M. K. McLean.—Interne, City Hospital.
 F. W. McRae.—Interne, Lakeside Hospital, Cleveland.
 J. R. McVay.—Interne, Lakeside Hospital, Cleveland.
 H. P. Makel.—Interne, St. Agnes Hospital.
 D. R. Melen.—Interne, Rochester General Hospital, N. Y.
 H. S. Morgan.—Interne, Bellevue Hospital, New York.
 T. V. Moore.—Instructor in Psychology, Catholic University, Washington, D. C.
 R. A. Morison.—Resident Physician, Royal Victoria Hospital, Montreal.
 H. S. Newcomer.—Resident Pathologist, Pennsylvania Hospital, Philadelphia.
 T. C. Peightal.—Interne, Roosevelt Hospital, New York.
 Mary Putman.—Interne, N. Y. Infirmary for Women and Children, New York.
 D. N. Richards.—Interne, Montreal Maternity Hospital, Canada.
 E. L. Richards.—Interne, Phipps Psychiatric Clinic.
 L. L. Rothschild.—Interne, Phipps Psychiatric Clinic.
 A. G. Schnack.—Interne, Mass. General Hospital, Boston.
 Katherine J. Scott.—Assistant in Anatomy, University of California.
 J. C. Shellito.—Interne, Harper Hospital, Detroit, Mich.
 D. M. Shewbrooks.—Interne, City and County Hospital, St. Paul, Minn.
 H. M. Slater.—Interne, City and County Hospital, St. Paul, Minn.
 D. C. W. Smith.—Interne, City Hospital.
 L. E. Smith.—Interne, Presbyterian Hospital, San Juan, P. R.
 L. H. Smith.—Interne, Garfield Memorial Hospital, Washington, D. C.
 Mary H. Swan.—Pathologist, Central Hospital, Ill. C. R. R., Chicago.
 B. Tappan.—Interne, Cincinnati General Hospital, O.
 W. C. Thomas.—Interne, Union Protestant Infirmary.
 J. C. Turner, Jr.—Interne, St. Luke's Hospital, New York.
 V. R. Turner.—Interne, St. Luke's Hospital, New York.
 J. E. Walker.—Interne, City Hospital.
 C. L. Warner.—Interne, Hospital for Women of Maryland.
 H. S. Whisman.—Interne, Roosevelt Hospital, New York.
 L. H. Williams.—Interne, Polyclinic Hospital, New York.
 F. S. Woo.—Student, Department of Hygiene, Harvard Medical School.

From the beginning of the European war up to September 30, 1915, the following graduates of the Medical School have been in Red Cross work in various areas of hostility: J. A. C. Colston, E. F. Ducasse, R. Fayerweather, V. N. Leonard, F. O. W. Reinhard, J. J. S. Schmitt, H. N. Shaw, D. M. Shewbrooks, H. R. Slack, Jr., L. C. Spencer, J. E. Stowers, and M. H. Todd.

Respectfully submitted,

J. WHITRIDGE WILLIAMS,
Dean.

REPORT OF THE DEPARTMENT OF ENGINEERING

TO THE PRESIDENT OF THE UNIVERSITY:

We beg to hand you herewith the second annual report of the Department of Engineering, for the year ending June 30, 1915.

During the year a number of important steps in the organization of the department have been taken. Perhaps the most striking has been the complete removal of the work to Homewood. The laboratory of Electrical and Mechanical Engineering was completed in September, and all professional courses have been conducted in this building since the opening of the academic year in October, 1914. The building has fully met our expectations as a modern and thoroughly well equipped "plant" for giving instruction in Engineering.

On the occasion of your inauguration as President, on May 20th, 1915, a feature of the celebration was the dedication on May 21st, of the laboratory of Electrical and Mechanical Engineering. A stirring dedicatory address, congratulating the University on its entrance into the new field was delivered by Gen. George W. Goethals, Corps of Engineers, U. S. A.

The power station which contains much of the equipment of the Department of Engineering was completed early in the year and during the winter furnished light and heat to the laboratories of Engineering and also to the Academic Building. Many features of the power station were designed for purposes of instruction, and have been so used during the year.

At the end of the year the Trustees authorized the erection of an additional building. This building will be erected on the west side of the south quadrangle, facing the present laboratory of Electrical and Mechanical Engineering. It will be devoted to the work in Civil Engineering. The preparation of the plans was immediately begun, and it is expected the building will be ready for occupancy by the end of the summer of 1916.

Two additions to the Faculty of Engineering have been made as follows:

Frank Lloyd Weaver, B. C. E. (University of Michigan) formerly Instructor in Civil Engineering at the University of Oklahoma, to be Instructor in Civil Engineering at this University.

John Harland Billings, B. A. Sc. (University of Toronto) S. M. (Harvard University and Massachusetts Institute of Technology) formerly Instructor in Mechanical Engineering at the University of Missouri, to be Instructor in Mechanical Engineering in this University.

A series of four public lectures on the subject of "Efficiency" were delivered, under the auspices of the department, in McCoy Hall, by Mr. Harrington Emerson. They were largely attended.

In the past year for the first time, students have been registered in all four years of the regular undergraduate curriculum. Graduate courses in Electrical Engineering have been conducted by Professor Whitehead and Dr. Kouwenhoven. The course in Surveying was conducted by Professor Tilden and Mr. Jones, assisted by Mr. J. S. Gorsuch during the first five weeks of the summer. With one or two exceptions the members of the third-year class were located for the summer months in manufacturers' shops or engineering organizations.

Following is a list of courses which were given:

CIVIL ENGINEERING

Undergraduate Courses

Civil Engineering 1. Theory of the Strength of Materials and Elements of Structural Design. *Three lectures or recitations and four hours of drafting room or laboratory work, weekly, through the year.* Professor Tilden.

Civil Engineering 2. Theory of Structures and Design. *Two lectures or recitations and four hours of drafting room, field or laboratory work, weekly, through the year.* Professor Tilden.

Civil Engineering 3. Elements of Sanitary Engineering. *Three lecture or recitation hours, and four hours in laboratory or drafting room, weekly, second half-year.* Mr. Jones.

ELECTRICAL ENGINEERING

Advanced Courses

Seminary and Journal Meeting. *One hour weekly, through the year.* Professor Whitehead.

Theory of Electrical Transmission of Energy. *Three hours weekly, through the year.* Professor Whitehead.

Electrical Measurements. *Two hours weekly, through the year.* Dr. Kouwenhoven.

Undergraduate Courses

Electrical Engineering 1. *Four hours weekly, through the year.* Professor Whitehead.

Laboratory Work. *Five afternoons weekly, through the year.* Professor Whitehead, Dr. Kouwenhoven and Mr. Pullen.

MECHANICAL ENGINEERING

Undergraduate Courses

Mechanical Engineering 1. Thermodynamics of Power Production. *Four lecture hours weekly, through the year and four hours of laboratory, weekly.* Professor Thomas.

Mechanical Engineering 3. Power Plant Design. *Three hours weekly, second half-year.* Professor Thomas and Associate Professor Christie.

The following courses required of all students in Engineering were also given:

Hydraulics. *Three lecture or recitation hours and four hours of laboratory work weekly for the second half-year.* Mr. Jones.

Engineering Drawing and Kinematics. *Four hours in the drafting room weekly, throughout the year.* Professor Thomas, Professor Tilden and Mr. Jones.

Surveying. Five weeks of field work at the close of the second year. Professor Tilden, Mr. Jones and an assistant.

The total attendance of students during the year was 124. Of these 19 were graduate students, one of whom was a candidate for the degree Doctor of Philosophy the others pursuing undergraduate courses in Engineering. Three candidates for the degree Bachelor of Science in Engineering were graduated at the end of the year, having entered the undergraduate courses with advanced standing and so being able to complete them in two years. There were 17 students in the courses of the third year.

Professor Tilden as a member of the Committee on Materials for Road Construction, of the American Society of Civil Engineers, has contributed to the work of that Committee. Professor Tilden has also devoted much time to questions pertaining to the grounds at Homewood.

Professor Thomas has served as a member of the Committee on Air Machinery, of the American Society of Mechanical Engineers, and as a member of the delegation from this University to the Convention of The Association of American Universities, held at the University of California in August, 1915. He has conducted two series of experimental studies, one on improved methods of cooling water for condensation, and one on utilizing the explosion in gas engines for the direct pumping of water. He has also carried further his investigation of the properties of superheated steam. In connection with the first-mentioned tests, a permanent cooling pond has been constructed at Homewood which has materially improved the efficiency of the power plant.

Professor Whitehead with the assistance of Mr. Pullen has continued his studies of the electrical properties of air at atmospheric pressure. Professor Whitehead has also continued the editorial and other work of the office of Chairman of the Electro-Physics Committee of The American Institute of Electrical Engineers. Dr. Kouwenhoven has made an experimental study of certain obscure questions in the performance of polyphase watt-hour meters, the results of which will be published in the near future.

Professor Whitehead has published the following paper:

J. B. Whitehead.

The Electric Strength of Air—VI. *Proceedings of The American Institute of Electrical Engineers*, May, 1915. Pages 843-865.

The Seminary and Journal Meeting of Electrical Engineering has met weekly. The following papers were presented in the Seminary.

Professor Whitehead:—"Electrical Conduction Through Gases"; "Theories of Corona."

Dr. W. B. Kouwenhoven:—"The Temperature Curve of Electric

Machines"; "The Measurement of High Values of Continuous Voltage."

Mr. M. W. Pullen:—"The Measurement of Capacity and Dielectric Constant"; "The Aluminum Electrolytic Cell."

Mr. W. S. Brown:—"Modern Practice in Wireless Telegraphy"; "Electric Operation for the Maryland and Pennsylvania Railroad."

During the year seventeen visits to high schools in ten counties of the State have been made by the Professors of Engineering. The object of these visits was to give information as to the scholarships available in the Department of Engineering and to discuss the relation between the graduating requirements of the high schools and the entrance requirements of the University. In many of these visits addresses have been made to the whole student body. We have been met in all cases with courtesy by the Principals of the high schools and there has been evident at all points a wish to coöperate with the University. We have gathered the impression that the establishment of the Department of Engineering has already been accompanied by a very healthy reaction on the high schools of the State.

During the year seventy-one scholarships in the Department of Engineering were awarded to residents of Baltimore City and seventeen counties of the State. The complete list of scholarship holders is appended hereto.

SCHOLARSHIPS CREATED BY ACT OF LEGISLATURE, 1912

Graduates of Maryland Colleges

Joseph R. Branham (Washington College).
J. Wilmerton Darley (Western Maryland College).
William J. Deimel (Rock Hill College).
J. Stanley Gorsuch (Maryland Agricultural College).
James M. Lednum (Maryland Agricultural College).
George C. Reier (Washington College).
Carl L. Schaeffer (Western Maryland College).
George L. Winslow (St. John's College).

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Residents of Baltimore City and the Counties

Charles M. Bartlett, of Talbot County. [Senatorial]
Donald P. Bellows, of Baltimore County. [At large]
Charles W. Black, of Baltimore (Fourth District).
I. Vernon Brumbaugh, A. B., of Caroline County. [Senatorial]
Guy L. Bryan, Jr., of Dorchester County. [Senatorial]
Ross B. Cameron, of Cecil County.
William D. Cecil, of Queen Anne's County. [Senatorial]
Charles W. Chealey, of St. Mary's County. [Senatorial]
Hyman A. Cohen, of Baltimore (Second District).
Edwin S. Davis, of Baltimore County.
John L. Defendorf, of Montgomery County. [Senatorial]
Ryland N. Dempster, of Baltimore (Third District).
Richard S. Dodson, Jr., of Talbot County.
Cyrus L. Doub, of Frederick County. [Senatorial]
John J. Downey, of Montgomery County.

Harry Ewald, of Allegany County.
 William S. Fitzgerald, A. B., of Somerset County. [Senatorial]
 Frank I. Fonaroff, of Baltimore (Fourth District).
 Thomas H. Hardinge, of Howard County. [Senatorial]
 E. Gerry Hall, of Baltimore (Third District).
 George S. Harris, of Queen Anne's County.
 Roger C. Heimer, of Frederick County.
 John Y. Hollingsworth, of Harford County.
 Stanley L. Howard, of Baltimore County.
 Ulric O. Hutton, of Montgomery County. [At large]
 J. Suter Jammer, of Allegany County.
 J. Marvin Johnson, of Dorchester County.
 Albert B. Junkins, of Baltimore (Fourth District). [Senatorial]
 Erman R. Kauffman, of Carroll County.
 Jacob Levin, of Baltimore (First District). [Senatorial]
 Morris Levin, of Baltimore (First District).
 Roger E. Martz, of Washington County.
 Louis Meyerhoff, of Baltimore (Second District).
 Noble L. Owings, of Baltimore (Third District). [Senatorial]
 Edward E. Perkins, Jr., of Prince George's County. [Senatorial]
 William B. Pratt, of Cecil County. [Senatorial]
 Milton Reiner, of Baltimore (Second District).
 George C. Rhoderick, Jr., of Frederick County.
 John D. Roop, Jr., of Carroll County. [Senatorial]
 Eli Silberstein, of Baltimore (First District).
 E. Guy Stapleton, of Baltimore County. [Senatorial]
 Bernard A. Sullivan, of Baltimore (Second District). [Senatorial]
 Joseph T. Thompson, of Baltimore. [At large]
 John M. Twigg, of Allegany County. [Senatorial]
 Herman Wacker, Jr., of Baltimore (Fourth District).
 E. Lauman Warner, of Baltimore County.
 J. Stuart Watson, of Charles County. [Senatorial]
 William D. Webb, of Harford County.
 Walter E. Weeks, of Baltimore (Third District).
 Alexander McW. Wolfe, of Baltimore. [At large]
 John W. Young, of Somerset County.
 Louis McC. Young, of Washington County. [Senatorial]
 Louis M. Zeakind, of Baltimore (First District).

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**SCHOLARSHIPS NOT PROVIDED FOR BY THE LEGISLATURE BUT
 CREATED BY THE TRUSTEES FOR STUDENTS ENTERING
 IN OCTOBER, 1912**

David H. Barron, of Baltimore.
 James P. Cockey, of Baltimore County.
 R. Wilson Evitt, of Baltimore County.
 Frederick T. Iddings, of Howard County.
 David H. Johnston, Jr., of Baltimore.
 Thomas S. Poole, of Harford County.
 E. LeRoy Smith, of Harford County.
 Abraham Tobias, of Baltimore.
 James G. Webster, of Baltimore.
 Hiram W. Woodward, of Baltimore.

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NEEDS OF THE DEPARTMENT OF ENGINEERING

Although the Department of Engineering is not yet fully organized, the buildings and equipment being still in process of construction and the full complement of courses and students not yet having been reached, the first two years of operation have nevertheless emphasized several definite needs.

First, is the need of an additional branch, Chemical Engineering. A number of inquiries for courses in this subject have been received. It will be recalled that in the original plans for the establishment of the Department this branch was mentioned as that which should first follow the three already in operation. Courses in Chemical Engineering can be added to the Department perhaps more readily than could those of any other branch of Engineering. It appears probable that with the completion of the Civil Engineering and Chemical Laboratories and by the utilization of some space in the Electrical Engineering Laboratory no additional building space would be required for Chemical Engineering for a number of years. The principal requirements therefore for making this extension are the annual expenses of a faculty and a moderate amount for experimental equipment.

A second most important need is a closer contact with the courses in other departments of the University. If, as is now probable, all the work of the University be transferred to Homewood next year, much of this difficulty will be removed. It should be pointed out however, that the presence of other departments of the University in the buildings of the Department of Engineering will of necessity restrict the working efficiency of all of the departments concerned. Consequently the complete fulfillment of the needs of the Department in this direction will only be reached when all of the scientific laboratories of the University are erected.

The present equipment of the laboratories offers facilities, which are perhaps unequaled anywhere else, for investigation and research in the three branches of Engineering already established. It is important that this fact should be realized and emphasized so that the number of graduate students in the Department may be increased.

A closer relation and better coöperation with the high schools of the State is highly desirable. As stated above in this report the faculty has already begun a systematic series of visits to the high schools and good results have been accomplished. This work is one, however, which will require constant attention and is one in which all members of the University can be of assistance. The concrete need is that the better grade of schools should encourage their graduates to come to us and should adjust their graduating requirements as nearly as possible to the entrance requirements of the University. More important still is the need that those approved high schools which do not now give courses equivalent to our requirements for entrance be encouraged and stimulated to do so.

C. J. TILDEN,
Professor of Civil Engineering.

C. C. THOMAS,
Professor of Mechanical Engineering.

J. B. WHITEHEAD, *Secretary,*
Professor of Electrical Engineering.

REPORT OF THE REGISTRAR

TO THE PRESIDENT OF THE UNIVERSITY:

During the year 1914-1915 the academic staff included two hundred and thirty-two teachers, eighty-six in the philosophical and engineering departments and one hundred and forty-six whose work lay wholly or chiefly in medicine. There were also thirty-six lecturers, most of them non-resident, who gave single lectures or short courses. The number of students enrolled in the regular courses was nine hundred and twenty-six, of whom four hundred and eighty-seven were residents of Maryland, four hundred and twenty-seven came here from forty-three other States and Territories of the Union, and twelve from foreign countries. Among the students were six hundred and thirty-seven already graduated, of whom two hundred and thirty-five were enrolled in the department of Philosophy and the Arts (including forty-one women), three hundred and eighty-three in the department of Medicine (including thirty-nine women), and nineteen in the department of Engineering. There were one hundred and sixty-nine candidates for the degree of Bachelor of Arts, one hundred and four candidates for the degree of Bachelor of Science in Engineering, and sixteen were enrolled as special students, pursuing courses of study for which they seemed fitted, without reference to graduation. The college courses for teachers were attended by one hundred and eighty-nine persons; the summer college courses of 1914 by two hundred and eighty-seven; the summer courses for physicians (1914) by sixty-nine. The enrolment for the year is summarized below:

<i>Faculty</i>	
President and Professors.....	60
Clinical Professors.....	7
Associate Professors.....	37
Associates	31
Instructors and Assistants.....	97
	232
Lecturers for the year.....	36

Students

I. Graduate Students:

A. Department of Philosophy:

1. Fellows by Courtesy.....	13
2. Fellows:	
University	20
Adam T. Bruce.....	1
William S. Kayner.....	1
Edmund Law Rogers.....	1
3. George Peabody Scholar.....	1

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4. Other Graduate Students:		
a. Candidates for higher degrees.....	138	
b. Special Students.....	60	
		<hr/> 235
B. Department of Medicine:		
1. Candidates for the degree of Doctor of Medicine	361	
2. Physicians attending Special Courses.....	22	
		<hr/> 383
C. Department of Engineering:		
1. Candidate for a higher degree in Engineering,	1	
2. Candidates for the degree of Bachelor of Science in Engineering.....	18	
		<hr/> 19
II. Undergraduate Students:		
1. Candidates for the degree of Bachelor of Arts....	136	
2. Candidates for the degree of Bachelor of Science in Engineering.....	82	
3. Candidates for Matriculation.....	55	
4. Special Students.....	16	
		<hr/> 289
Total		<hr/> 926
III. Attendants on College Courses for Teachers.....		189
IV. Attendants on Summer Courses:		
1. Courses for Physicians.....	69	
2. College Courses.....	287	
		<hr/> 356
Total receiving instruction.....		1471
Counted twice.....		58
		<hr/> 1413
Net total.....		1413

During the past thirty-nine years, eight thousand and one individuals have been enrolled as students in the regular sessions. Of these three thousand one hundred and forty-four are registered as from Maryland (including two thousand four hundred and thirty-three from Baltimore), and four thousand eight hundred and fifty-seven from eighty-three other States and countries. Five thousand four hundred and ninety-seven persons entered as graduate students, and two thousand five hundred and four as undergraduates. Of the undergraduates, six hundred and seventy-four have continued as graduate students, many of them proceeding to higher degrees. It thus appears that six thousand one hundred and seventy-one persons have followed graduate studies here. The following table shows the enrolment of students from the beginning:

Report of the Registrar

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	Total *	Graduates (Inc. Fellows)	Undergraduates		College Courses for Teach- ers	Summer Courses
			Candidates for Degrees	Special		
1876-77	89	54	12	23		
1877-78	104	58	24	22		
1878-79	123	68	25	25		
1879-80	159	79	32	48		
1880-81	176	102	37	37		
1881-82	175	99	45	31		
1882-83	204	125	49	30		
1883-84	249	159	53	37		
1884-85	290	174	69	47		
1885-86	314	184	96	34		
1886-87	378	223	108	42		
1887-88	420	231 { Phil., 220 Med., 11	127	62		
1888-89	394	216 { Phil., 202 Med., 14	129	49		
1889-90	404	229 { Phil., 209 Med., 20	130	45		
1890-91	468	276 { Phil., 253 Med., 43	141	51		
1891-92	547	337 { Phil., 298 Med., 39	140	70		
1892-93	551	347 { Phil., 297 Med., 50	123	71		
1893-94	522	344 { Phil., 261 Med., 83	122	55		
1894-95	589	412 { Phil., 284 Med., 128	126	51		
1895-96	596	406 { Phil., 253 Med., 153	149	41		
1896-97	520	344 { Phil., 210 Med., 134	144	22		
1897-98	641	456 { Phil., 215 Med., 241	152	23		
1898-99	649	462 { Phil., 210 Med., 252	163	24		
1899-1900	645	469 { Phil., 185 Med., 284	159	17		
1900-01	651	473 { Phil., 168 Med., 305	158	20		
1901-02	694	530 { Phil., 172 Med., 358	158	6		
1902-03	695	532 { Phil., 187 Med., 345	147	16		
1903-04	715	556 { Phil., 202 Med., 354	141	18		
1904-05	746	563 { Phil., 195 Med., 368	160	23		
1905-06	720	530 { Phil., 162 Med., 368	163	27		
1906-07	671	504 { Phil., 158 Med., 346	146	21		
1907-08	683	518 { Phil., 171 Med., 347	142	23		
1908-09	731	562 { Phil., 187 Med., 375	138	31		
1909-10	821	595 { Phil., 188 Med., 407	143	14	69	
1910-11	916	625 { Phil., 210 Med., 415	180	10	101	
1911-12	1206	623 { Phil., 217 Med., 406	170	9	116	235†
1912-13	1090	600 { Phil., 215 Med., 385	192 { A. B., 165 S. B., 27	8	119	201
1913-14	1325	607 { Phil., 213 Med., 378 Eng., 16	249 { A. B., 170 S. B., 79	14	167	347 { Coll., 277 Med., 70
1914-15	1413	637 { Phil., 235 Med., 383 Eng., 19	273 { A. B., 169 S. B., 104	16		356 { Coll., 267 Med., 89

* Excluding duplicates.

† Summer of year first named, and so below.

The geographical distribution of the students in the regular sessions is shown by the following table:

	From Maryland. and Countries.			From Other States				From Maryland. and Countries.			From Other States		
1876-77	-	59	-	-	-	80	1896-97	-	254	-	-	-	308
1877-78	-	71	-	-	-	83	1897-98	-	279	-	-	-	362
1878-79	-	76	-	-	-	47	1898-99	-	277	-	-	-	372
1879-80	-	97	-	-	-	62	1899-1900	-	262	-	-	-	383
1880-81	-	95	-	-	-	81	1900-01	-	270	-	-	-	381
1881-82	-	97	-	-	-	78	1901-02	-	273	-	-	-	421
1882-83	-	106	-	-	-	98	1902-03	-	283	-	-	-	412
1883-84	-	123	-	-	-	126	1903-04	-	294	-	-	-	421
1884-85	-	130	-	-	-	160	1904-05	-	312	-	-	-	434
1885-86	-	130	-	-	-	184	1905-06	-	304	-	-	-	418
1886-87	-	142	-	-	-	216	1906-07	-	257	-	-	-	414
1887-88	-	199	-	-	-	221	1907-08	-	267	-	-	-	416
1888-89	-	133	-	-	-	211	1908-09	-	311	-	-	-	420
1889-90	-	215	-	-	-	189	1909-10	-	286	-	-	-	468
1890-91	-	255	-	-	-	233	1910-11	-	337	-	-	-	478
1891-92	-	273	-	-	-	274	1911-12	-	337	-	-	-	465
1892-93	-	266	-	-	-	285	1912-13	-	358	-	-	-	442
1893-94	-	260	-	-	-	262	1913-14	-	436	-	-	-	420
1894-95	-	260	-	-	-	229	1914-15	-	487	-	-	-	439
1895-96	-	272	-	-	-	324							

The enrolment in the medical department, not including the summer courses, has been as follows:

	Candidates for M. D. of Med.			Drs. Total				Candidates for M. D. of Med.			Drs. Total		
1893-94	-	18	-	85	-	83	1904-05	-	291	-	77	-	368
1894-95	-	51	-	77	-	128	1905-06	-	293	-	75	-	368
1895-96	-	84	-	69	-	153	1906-07	-	268	-	83	-	346
1896-97	-	123	-	11	-	134	1907-08	-	277	-	70	-	347
1897-98	-	167	-	74	-	241	1908-09	-	297	-	78	-	375
1898-99	-	197	-	55	-	252	1909-10	-	334	-	73	-	407
1899-1900	-	211	-	73	-	284	1910-11	-	351	-	65	-	416
1900-01	-	209	-	96	-	305	1911-12	-	355	-	51	-	406
1901-02	-	239	-	129	-	368	1912-13	-	351	-	34	-	385
1902-03	-	256	-	89	-	345	1913-14	-	360	-	18	-	378
1903-04	-	276	-	78	-	354	1914-15	-	361	-	22	-	383

The attendance upon the regular graduate and undergraduate courses has been as follows during the last five years:

	1910-11	1911-12	1912-13	1913-14	1914-15
Mathematics	98	82	104	174	198
Physics	95	102	262	177	191
Chemistry	147	125	110	130	147
Geology and Mineralogy	48	47	51	57	65
Zoology, Botany, Plant Physiology	67	68	66	83	86
Greek	34	33	41	51	36
Latin	62	74	56	74	55
Classical Archaeology and Art	28	42	24	35	18
Sanskrit and Comparative Philology	18	24	27	26	33
Semitic Languages	22	26	16	22	17
English	185	163	191	251	271
German	95	116	104	116	114
French, Italian and Spanish	116	120	127	149	177
History	74	83	91	85	81
Political Economy	72	105	104	80	104
Political Science	28	31	35	24	31
Philosophy, Psychology and Education	65	72	73	75	...
Philosophy and Education .....	...	...	...	...	82
Psychology .....	...	...	...	...	17
Engineering (Civil, Elec. and Mech.) .....	...	...	...	47	78

The following tables record the enrolment in the College Courses for Teachers and in the Summer Courses since their initiation:

College Courses for Teachers

	1909-10	1910-11	1911-12	1912-13	1913-14	1914-15
Mathematics	9	15	8		6	
Chemistry		10			6	
Biology	3	4				
Latin	3		6	4	6	
Hebrew				1		
English Composition.....	29	28	36	26	27	27
English Literature.....	16	8	22	32	49	46
German	4	6	9	23	25	5
French	2	5	12	17	35	33
History	7	15	12	4	8	9
Education		14	21	21	21	43
Psychology				7	9	11
Political Economy.....						16
Hygiene						7

Summer Courses

	1911	1912	1913	1914	1915
Mathematics	23	8	9	16	19
Physics	14	11	7	13	27
Chemistry	25	29	41	23	39
Biology	59	9	19	18	15
Latin	22	9	12	9	6
English Composition.....	121	65	51	68	72
English Literature.....	48	39	37	49	35
German	33	24	20	20	46
French	26	26	15	27	29
Spanish	—	—	—	7	9
History	56	31	50	43	44
Education	172	95	148	135	245
Domestic Science and Art.....	24	15	27	22	31
Manual Training.....	24	4	19	12	24
Politics	—	—	—	14	16
Playground and Recreation.....	—	—	—	—	16
Psychology	—	—	—	—	15

Degrees were conferred during the year upon one hundred and seventy-one candidates—Bachelor of Arts, thirty-six; Masters of Arts, twelve; Doctors of Philosophy, thirty-one; Doctors of Medicine, eighty-nine; Bachelor of Science in Engineering, three. Since degrees were first conferred, in 1878, twelve hundred and fifty-eight persons have attained the Baccalaureate degree; fifty-nine (including fifteen women) the degree of Master of Arts; nine hundred and eighty-nine (including nineteen women) the degree of Doctor of Philosophy; and eleven hundred and forty-three (including one hundred and four women) the degree of Doctor of Medicine,—the whole number of individuals graduated being thirty-one hundred and twenty-nine. Certificates of proficiency in applied electricity were awarded to ninety-one persons from 1889 to 1899.

	A. B.	Ph. D.		A.B.	A.M.	Ph.D.	M.D.	B.S.
1877-78	0	4	1896-97	36	..	42	15	..
1878-79	3	6	1897-98	49	..	36	22	..
1879-80	16	5	1898-99	33	..	42	33	..
1880-81	12	9	1899-1900	46	..	35	43	..
1881-82	15	9	1900-01	41	..	30	53	..
1882-83	10	6	1901-02	40	..	17	57	..
1883-84	23	15	1902-03	46	..	27	49	..
1884-85	9	13	1903-04	37	..	31	45	..
1885-86	31	17	1904-05	33	..	35	54	..
1886-87	24	20	1905-06	48	..	32	85	..
1887-88	34	27	1906-07	47	..	35	76	..
1888-89	30	20	1907-08	47	..	28	63	..
1889-90	37	33	1908-09	37	4	27	53	..
1890-91	51	28	1909-10	14	3	25	69	..
1891-92	41	37	1910-11	31	11	28	85	..
1892-93	40	28	1911-12	37	5	32	85	..
1893-94	41	34	1912-13	35	11	32	76	..
1894-95	37	47	1913-14	52	13	30	91	..
1895-96	37	36	1914-15	36	12	31	89	3
				—	—	—	—	—
				1256	59	939	1143	3

THOMAS R. BALL,
Registrar.

REPORT OF THE LIBRARIAN

TO THE PRESIDENT OF THE UNIVERSITY:

I submit herewith as Librarian my seventh annual report, covering the fiscal year ending June 30, 1915.

LIBRARY COMMITTEES

The committee for the Philosophical and Collegiate departments, consisting of President F. J. Goodnow (Chairman), and Professors E. C. Armstrong, B. L. Gildersleeve, E. B. Mathews, W. W. Willoughby, and the Librarian (Secretary), has met monthly.

The Medical School Library Committee, made up of Dr. W. H. Howell (Chairman), Drs. J. J. Abel, J. Howland, T. C. Janeway, W. Jones, F. P. Mall, J. W. Williams, and the Librarian of the University, met irregularly.

STAFF

The Library staff remained unchanged save that Miss Hilda Frush was transferred in October from the recataloging staff to take charge of the Medical School Library.

ACCESSIONS

Irrespective of binding, we received of books and pamphlets, by purchase, 4747 volumes in 4640; by gift, 4136 volumes in 4029; by exchange, 2425 volumes; by U. S. Government deposit, 138 volumes; by Maryland Geological Survey deposit, 53 volumes; J. H. U. manuscript dissertations, 40; two copies each of 19 J. H. U. printed dissertations. Total 11,577 volumes in 11,363 pieces. In addition, we received 151 maps (60 by purchase, 47 by gift, and 44 by exchange), 22 manuscripts, 108 prints, 2 charts, 234 odd numbers of periodicals, 25 plates and 6 facsimiles.

Of these receipts 8,163 were bound, but as 27 volumes were withdrawn, the net bound accessions were 8,136. The present accession number of bound volumes in the library is 190,814.

Accessions showed a marked falling off this year, because of diminished output in Europe and slackened communication. Instead of our usual excess of twenty thousand pieces, we have under twelve thousand. Most of the falling off is in exchanges. Here but 2,425 pieces came in, as against the usual 9,000.

PURCHASES

Besides securing sets of Chemical abstracts and *Ergebnisse der inneren medicin* and forty more volumes of *Jahrbuch für kinderheilkunde* for the Department of Pediatrics, the first branch of the Medical School Library, we established a second branch in the Chemical

Laboratory of the Department of Medicine. As this is on the grounds of the Johns Hopkins Hospital, the purchases will be mainly reference works, such fundamental sets, for example, as have been bought this year: Heart, Journal of Biological Chemistry, Journal of Pharmacology and Experimental Therapeutics. This branch, as its predecessor, is supported by the Welch Fund.

Last year some of the fundamental journal files in mechanical engineering were added; this year it was civil engineering that was thus stressed, complete sets of *Annales des ponts et chaussées* (271 vols.), *Le génie civil* (63 vols.), *Minutes of Proceedings of the Institution of Civil Engineers* (229 vols.), and *Proceedings of the American Society for Testing Materials* (12 vols.), being put on the shelves.

In history, the accession of the *Bulletin de la Société de l'histoire de France* (1834-1911) completed our file of this society's serial publications. Of *Mitteilungen der Antiquarischer gesellschaft zu Zurich*, bde. 9-27 likewise filled out a set. Further, files of *Monumenta medii aevi historica res gestas Poloniae illustrantia* (18 vols.), *Revue d'histoire moderne et contemporaine* (19 vols.), and *Doebner, Urkundenbuch der Stadt Hildesheim* (8 vols.) are worthy accretions to our stock of source material.

However, the most important purchase for the historico-political group of studies was Hansard's Parliamentary debates with its predecessor, Cobbett's Parliamentary History. In these 741 volumes are found the proceedings of the British Parliament from the Norman Conquest to date. The set is in excellent condition, substantially and uniformly bound in buckram.

GIFTS

Four gifts deserve special mention.

Mr. W. A. Marburg presented to the Medical School Library the collection of drawings brought together by the late Sir Jonathan Hutchinson (1828-1913), Hunterian Professor of Surgery in the Royal College of Surgeons. The collection numbers about 10,000 pieces. It is made up in part of the owner's own work in colors and in part extracted from printed sources far and wide. Each drawing, photograph, or plate is usually mounted on heavy cardboard, on the verso of which the identification or discussion is written or pasted. The cases are then assembled according to topic, and enclosed in cloth portfolios or heavy envelopes, bearing titles clearly written or printed.

This is the second time within a decade that Mr. Marburg has made splendid contribution to the Medical School Library, since in 1906 the Warrington Dispensary Collection of Medical Classics, numbering nearly 1,000 volumes, came into our possession through his generosity. And in both instances it was our faithful friend, Sir William Osler, who brought the opportunity to Mr. Marburg's attention.

Dean Edward H. Griffin presented a sum of money with which to secure about 250 volumes in philosophy. In addition, he gave from his personal library 74 volumes, mainly in philosophy, together with 86 volumes and 80 numbers of (Littell's) *Living Age*.

Carrying out the expressed desire of her husband, Mrs. Christopher Johnston has put the University into possession of such portions of his professorial library as seemed likely to be of service to the Oriental Seminary. 252 bound volumes and 97 pamphlets were received. The value of the collection lies in the number of texts which it contains. Many of them bear Professor Johnston's annotations.

Mrs. Benjamin I. Cohen and Miss Eleanor S. Cohen presented as a memorial to the late Benjamin I. Cohen a miscellaneous library of 333 volumes and provided for them a special book-plate. Note should be made of Conrad Loddiges' Botanical Cabinet; a series of twenty volumes, containing 2,000 excellently colored plates of plants with descriptive letterpress.

I have the pleasure to report the usual annual contribution of \$75.00 on the part of Mr. and Mrs. Charles W. Field to maintain the von Lingen Collection of German geological surveys, though denied the satisfaction of publishing the name of a friend who has this year, as from the beginning, twelve years ago, enabled us to secure the issues of the International Catalogue of Scientific Literature.

Henry Holt & Co. have followed an old custom in sending us their new issues, 125 volumes being received this year.

Mr. William B. Oliver presented an autograph copy of Luther Burbank, his methods and discoveries, and their practical application. 1914-1915. 12 vols.

Finally, record of the larger gifts from members of the faculty should be entered as follows: E. C. Armstrong 38, G. E. Barnett 16, J. W. Bright 17, E. F. Buchner 44, B. L. Gildersleeve 10, F. J. Goodnow 75, J. H. Hollander 34, H. A. Kelly 53, C. C. Marden 23, W. P. Mustard 82, and Ira Remsen 249 volumes.

ANALYSIS OF EXPENDITURES

I. *Philosophical and Collegiate Department*

Salaries	\$12,540.24	
Books	4,882.31	
Periodicals	2,956.92	
Binding	3,770.92	
Maps	22.88	
A. L. A. cards	58.93	
Berlin cards	31.85	
L. O. Cards	600.00	
Card supplies	291.00	
Cabinets	356.58	
Transportation	473.34	
Other supplies	194.51	
		\$27,204.48

II. *Medical School*

Salary	\$ 513.58	
Books	632.70	
Periodicals	1,235.85	
Binding	277.71	
C. B. cards	61.95	
Miscellaneous	41.45	
		\$2,763.74

III. *Recataloging*

Salaries	\$2,104.08
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CATALOGING DEPARTMENT

The Cataloging Department has about resumed its regular organization this year. Since June, 1910, it has not only handled current accessions, but, through a special staff added to it, has been reworking accessions made prior to November, 1908, the date at which the present staff was appointed. To insure good results, the members of the permanent staff were transferred to responsible positions in recataloging, and young library school graduates were placed under charge of the Chief Cataloger to handle the current additions. At the end of the summer Miss E. S. Thies, who was chief reviser of the special staff, Miss A. C. Carson, and Miss M. L. Watts resumed their regular duties, and seven persons were dropped, leaving but two persons to finish the task of recataloging.

During the year the Sanskrit Library was recataloged, as well as the last portions of the Classical and Modern Language Libraries, and good headway was made in the Semitic Library, which is the last department to be visited.

As the Library of Congress has not yet printed schedules of classification for the subjects recataloged this year, classification has lagged. Mr. Mattern has accordingly devoted the residue of his time after current classification to active assistance in recataloging the rather difficult fields tilld this year.

A review of this work, now closing its fifth year, will be postponed till my next report, when it is expected that the last special cataloger will have left. Suffice it to say that the cost will be about 1% below the estimate made more than five years ago.

The tables given below show that this department handled 14,835 titles, representing 22,628 volumes and 39 maps, for which 73,698 cards were made.

The record in detail follows:

Cards	Regular Staff	Special Staff
Main entries (i. e. titles).....	8566	6269
Duplicate main entries.....	6638	8053
Added entries.....	15879	11583
Duplicate added entries.....	5187	2362
Shelf list entries.....	2242	4084
Accession entries.....	956	298
Source entries.....	819	552
Cross references.....	506	254
Total cards.....	40243	33455
Volumes.....	13615	9013
Maps.....	39	

In current accessions, cards were secured from the Library of Congress for 31%, from Berlin for 29%, while record of the remaining 40% was prepared by us—multigraphed or typewritten.

Of the 73,698 cards prepared for all volumes handled 22,459 were printed by the Library of Congress, 7,231 by the Royal Library of Berlin, 14,871 on our multigraph, and the remaining 29,137 were typewritten.

In the Reading Room Catalog, which aims to be complete for the University, 47,330 cards were filed by the custodians. The total now is 365,873 cards.

In the depository catalog of the Library of Congress 31,323 cards were filed in 326 hours, or 96 an hour (cf. 90 last year). Further, 78 hours were spent in revision.

We began this year to send the Library of Congress, at its request, copies of cards for such of our current accessions as are not acquired by that library. These join similar deposits there from other libraries, with the object of establishing in Washington a union catalog of the chief institutions in the United States.

BINDING

Mr. Munzner reports having collated and sent to local binders 4,028 volumes, which were bound at a cost of \$3,326.10, or 82½ cents per volume. This is less than \$5.00 more than was spent last year, but 365 more volumes were covered this year, the cost per volume last year being 90 2-3 cents per volume. This reduction was predicted in my last report, as a result of the more general use of buckram. The reduction was effected despite the fact that a special piece of binding had to be done, in which 140 volumes cost \$300.00. Of the total above given 758 volumes were rebound, and 240 went into Gaylord covers.

INTER-LIBRARY LOANS

In the operation of the Inter-library loan system, we borrowed 217 volumes from 17 institutions, and sent 88 volumes to 28 institutions.

M. L. RANEY,
Librarian.

REPORT OF THE JOHNS HOPKINS PRESS

(ABSTRACT)

TO THE PRESIDENT OF THE JOHNS HOPKINS UNIVERSITY:

I submit herewith the report of the Johns Hopkins Press for the past year.

The several serials have been maintained within the limits prescribed by the University as follows:

American Journal of Insanity. This journal is the official organ of the American Medico-Psychological Association. Its editorial control is in the hands of a committee of the association, consisting of Henry M. Hurd, M. D., and E. N. Brush, M. D., of Baltimore; G. Alder Blumer, M. D., of Providence, R. I.; J. Montgomery Mosher, M. D., of Albany, N. Y.; and Charles K. Clarke, M. D., of Toronto, Ontario. Vol. LXXXI (four numbers) was issued. This contained 846 pages, 8vo.

American Journal of Mathematics, edited by Professor Morley with the co-operation of Professors Cohen, Scott and other mathematicians. Numbers 3 and 4 (234 pages) completing Vol. XXXVI (464 pages quarto) and two numbers of Vol. XXXVII (214 pages) have been issued. Vol. XXXVII contains a portrait of John Napier.

American Journal of Philology, edited by Professor Gildersleeve. Numbers 3 and 4 (274 pages) completing Vol. XXXV (518 pages, 8vo.) and two numbers (252 pages) of Vol. XXXVI have appeared.

Beiträge zur Assyriologie und semitische Sprachwissenschaft, edited by Professor Haupt. No part appeared during the year.

Hesperia: Schriften zur germanischen Philologie, edited by Professor Collitz, and *Schriften zur englischen Philologie*, edited by Professor Bright. The following were published during the year: "Mixed Preterites in German," by O. P. Rein, 139 pages; "Der Teufel in den deutschen geistlichen Spielen des Mittelalters und der Reformationzeit. Ein Beitrag zur Literatur- Kultur- und Kirchengeschichte Deutschlands," by Dr. J. M. Rudwin, 206 pages; "The Attitude of Gustav Freytag and Julian Schmidt toward English Literature (1848-1862)" by Lawrence Marsden Price, 128 pages; "The Dramas of Lord Byron. A critical study," by Samuel C. Chew, 187 pages.

Johns Hopkins Hospital Publications. We have continued the publication on behalf of the Johns Hopkins Hospital, of the *Bulletin*, appearing monthly, and of the *Reports*, of irregular issue.

Of the *Bulletin* six numbers (182 pages) completing Vol. XXV (376 pages, 8vo.) and six numbers (240 pages) of Vol. XXVI have been issued. Of the *Reports*, no part appeared during the year.

The Johns Hopkins University Circular, including Annual Report of the President, University Register, Medical Department Catalogue,

etc., T. R. Ball, Editor. Four numbers (546 pages) completing Vol. XXXIII (1246 pages, 8vo.) and six numbers (576 pages) of Vol. XXXIV have been issued. These have included Conferring of Degrees, 1914,—Attendants on Summer Courses, 1914, issued in July; Catalogue and Announcement for 1914-1915 of the Medical Department, issued in October; Preliminary Register of the University, 1914-1915, issued in November; Papers from the Zoological Department, issued in December; Report of the President, 1913-1914, issued in January; Commemoration Day, 1915,—Five Years of Experimental Chemistry, 1910-1915, issued in February; Summer Courses, July 5 to August 2, 1915, issued in March; University Register, 1914-1915, issued in April; College Courses for Teachers, 1915-1916, issued in May; Inauguration of President Goodnow and Dedication of the new buildings, May 20, 21, 1915, issued in June.

The Johns Hopkins University Studies in Historical and Political Science. The Studies are issued under the direction of the departments of history, political economy and political science. One number (157 pages) completing Series XXXII (600 pages octavo) and three numbers (408 pages) of Series XXXIII have been published. These have included "Colonial Trade of Maryland," by M. S. Morris; "Money and Transportation in Maryland, 1720-1765," by Clarence P. Gould; "The Financial Administration of the Colony of Virginia," by Percy Scott Flippin; "The Helper and American Trade Unions," by John H. Ashworth.

Modern Language Notes, edited by Professors E. C. Armstrong, J. W. Bright, B. J. Vos and C. C. Marden (Managing Editor). Two numbers (80 pages) completing Vol. XXIX (280 pages quarto) and six numbers (200 pages) of Vol. XXX have been issued.

Elliott Monographs in the Romance Languages and Literatures. This is a new publication and is edited by Professor Armstrong. Three numbers have appeared as follows: "Flaubert's Literary Development in the Light of his *Mémoires d'un fou*, *Novembre*, and *Education Sentimentale*," by A. Coleman (169 pages); "Sources and Structures of Flaubert's *Salammbô*," by P. B. Fay and A. Coleman (55 pages); "La Composition de *Salammô* d'après la Correspondance de Flaubert," by F. A. Blossom (113 pages).

Reprint of Economic Tracts, edited by Professor Hollander. One number concluding the Third Series was issued during the year. This was a reprint of Sir Edward West's Essay on "The Application of Capital to Land, 1815." A Fourth Series is announced and will contain the following: "A Treatise of the Canker of England's Common Wealth," by Gerrard de Malynes, London, 1601; "A Discourse of Trade, from England unto the East Indies: Answering to diverse objections which are usually made against the same," by Thomas Mun, London, 1621; "The Treasure of Traffike. Or a Discourse of Forraigne Trade," by Lewis Roberts, London, 1641; "Brief Observations concerning Trade, and Interest of Money," by Josiah Child, London, 1668.

Terrestrial Magnetism and Atmospheric Electricity, edited by Dr. Bauer. Numbers 3 and 4 (134 pages) completing Vol. XIX (236 pages, 8vo) and two numbers (94 pages) of Vol. XX were issued.

Several new books were published during the year as follows: *An Outline of Psychobiology*, by Knight Dunlap. This was issued

in December. It contains 121 pages and 77 cuts, royal octavo. This book is offered as a starting point for many elementary students of psychology, who have little or no preparation in biology, and hence are seriously hampered in the reading of the standard physiological texts.

The Piscatory Eclogues of Jacopo Sannazaro, edited with introduction and notes by Wilfred P. Mustard, appeared in October. It contains 94 pages, crown octavo. This book comprises Latin poems which are very clever imitations or adaptations of some of Vergil's *Bucolics*. The Virgilian conventions are so far modified that the pastoral eclogue becomes a piscatory eclogue, or an idyl of fishermen. The singers are no longer shepherds, but fishermen, and the scene is no longer in Sicily, or Arcadia, but the Bay of Naples.

The Diplomacy of the War of 1812, by Frank A. Updyke. Professor Updyke delivered the Albert Shaw Lectures on Diplomatic History in 1914 and these lectures are now published under the above title. The volume was issued in October. In this volume the causes of the War of 1812 are clearly set forth. The Treaty of Ghent, the hundredth anniversary of which has recently been celebrated, is the central theme of the latter half of the volume. The negotiations leading to the signing of that treaty are clearly described.

Of this series of Albert Shaw Lectures, seven volumes have been published, describing different phases of American diplomacy.

The New Book Department received during the year 4579 volumes, including 886 sent on inspection. Of these 3809 were purchased by members of the University, 86 by the Library, and 684 were returned to the publishers. This department is rapidly growing as may be seen by comparing the figures for 1913-1914 which were as follows: Total volumes received 2988; sold to members of the University 2528, to the library, 60, and 400 were returned to the publishers.

Messrs. G. E. Stechert and Company and The Macmillan Company, both of New York, have continued to send regularly the inspection consignments. By this arrangement the faculty is able to see the leading books and pamphlets that are published in Europe and also to a considerable extent those issued in America. We greatly appreciate the services that these two firms are rendering, and no doubt it is of mutual advantage.

DISSERTATIONS PUBLISHED DURING THE YEAR

Following is a list of dissertations for the degree of Doctor of Philosophy published during the year, of which the required number of one hundred and fifty copies have been received by the University:

Ashworth, John H.: *The Helper and American Trade Unions.*

Bateman, H.: *The Quartic Curve and its Inscribed Configurations.*

Chew, Jr., Samuel C.: *The Relation of Lord Byron to the Drama of the Romantic Period.*

Elliott, Daniel Stanley: *A Comparative Study of the Light Sensibility of Selenium and Stibnite at 20° C. and -190° C.*

Flippin, Percy Scott: *The Financial Administration of the Colony of Virginia.*

Frederick, Edwin Louis: The Osmotic Pressure of Mannite Solutions between Ten and Forty Degrees.

Gorton, William Stuart: The Effect of Frequency upon the Corona.

Harcum, Cornelia Gaskins: Roman Cooks.

Houghton, Herbert Pierrepont: Moral Significance of Animals as Indicated in Greek Proverbs.

Karrer, Enoch: A Method of Determining the Radiant Luminous Efficiency of a Light Source by Means of a Cell whose Transmission Curve is identical with the Luminosity Curve of the Average Eye.

Kern, James William: Ana and Kata in Composition and with Case.

Lewis, Florence P.; A Geometrical Application of the Theory of the Binary Quintic.

MacKenzie, Donald: The Corona in Air at Continuous Potentials and Pressures Lower than Atmospheric.

Middlekauff, George Wiles: The Effect of Capacity and Self-Induction upon Wave-Length in the Spark Spectrum.

Musselman, Amos Sentman: Osmotic Pressure Measurements of Glucose Solutions at 30°, 40°, 50°, and 60°.

Seiple, William G.: The Seventy-Second Psalm.

Sparrow, Charles Mason: On the Effect of the Groove Form on the Distribution of Light by a Grating.

Stephenson, Lloyd William: The Cretaceous Deposits of North Carolina.

Ulrich, John Linck: Distribution of Effort in Learning in the White Rat.

C. W. DITTS,

Secretary, The Johns Hopkins Press.

REPORT ON THE OFFICIAL STATE BUREAUS CONNECTED WITH THE UNIVERSITY

TO THE PRESIDENT OF THE UNIVERSITY:

I submit herewith a report of the official State Bureaus conducted in coöperation with the Geological Department.

THE MARYLAND GEOLOGICAL SURVEY

The Maryland Geological Survey has now been in existence for nineteen years, having been established by an Act of the General Assembly in March, 1896. It has been in charge of Professor Clark as State Geologist from the beginning. The appropriation during the first two years amounted to \$10,000 annually. In 1898 a second act was passed providing \$5,000 additional to be used chiefly in the preparation of a base map of the State. Both of these Acts are still in operation, the total appropriation of the Survey, therefore, being at the present time \$15,000 annually. The Survey devotes its activities chiefly to geological studies and to the preparation of topographic maps of the State, although consideration is also given independently or in coöperation with other bureaus, both Federal and State, to the study of problems connected with terrestrial magnetism, forestry, hydrography, and agricultural soils of the State.

The Survey maintained for twelve years, from 1898 to 1910, a Highway Division. During the earlier years of this period the work was largely advisory. A testing laboratory was established and plans and specifications for road and street improvement by the state, county, and municipal authorities were prepared. In 1904 an Act was passed providing for the construction of State Aid roads, \$200,000 annually being appropriated by the State, to be met by an equal amount from the counties, the work to be done under the plans, specifications, and supervision of the State Geological Survey. In 1906, 1908, and 1910 \$384,000 in all were appropriated for the construction, under the auspices of the Geological Survey, of a modern highway from Baltimore to Washington. Altogether over \$1,500,000 were appropriated by the State and counties to be spent under the auspices of the Survey, and over 150 miles of modern roadway were constructed. During this period the various deposits available for road construction throughout the State were tested, as well as the various materials employed on the streets of most of the cities and towns of the state. Much advice in the matter of road and street construction was given to the public officials. In 1910 the highway work of the Survey was transferred to the State Roads Commission, which had been organized in 1908, and of which President Remsen and Professor Clark were members. They continued in this capacity until 1914.

The geological work, which is directly under the charge of the State Geologist and the Assistant State Geologist, Professor

Mathews, is divided into three divisions, covering the areas of the Piedmont Plateau, the Appalachian Region, and the Coastal Plain. Investigations are in progress in all these districts and extensive areas in each have already been studied. Reports have already been issued for Allegany, Garrett, Cecil, Calvert, St. Mary's, and Prince George's counties, while the investigations have been completed for Harford, Anne Arundel, Kent, Queen Anne's, Talbot, Caroline, and Washington counties. Work is now in progress in Baltimore, Frederick, Carroll, and Howard counties. In the conduct of the geological work the aid of numerous experts in various parts of the country has been sought, particularly in the study of the several groups of fossil plant and animal remains. Monographs on the Devonian, Lower Cretaceous, Eocene, Miocene, Pliocene, and Pleistocene deposits of the state have already been published, and similar reports on the Ordovician, Silurian, Carboniferous, and Upper Cretaceous are now in preparation. Special economic reports on building stones, clays, coals, limestones, and iron ores have been issued.

The topographical work has been continued in cooperation with the United States Geological Survey. The results of this work are presented to the public on the scale of one mile to one inch, either in the form of 15' sheets or in the form of county maps, showing the topography and election districts. They show in a very detailed manner not only the relief of the land but cultural features as well. Maps of all the counties have already been published. A map of Baltimore and vicinity on the scale of 1,000 feet to the inch is also in progress of publication. Three sheets have already been issued, each covering 20 square miles. A map on the same scale has also been published for Hagerstown and vicinity, and a similar map is in preparation for Cumberland and vicinity.

The investigations in terrestrial magnetism, hydrography, agricultural soils, and forestry have been proceeding as hitherto in cooperation with state and national bureaus. The agricultural soil survey of Montgomery country was completed during the past field season in cooperation with the U. S. Bureau of Soils. The forestry work is now for the most part in charge of the later-organized State Board of Forestry, but the Geological Survey will continue to publish county reports and maps on this subject.

THE MARYLAND WEATHER SERVICE

The Maryland Weather Service has been in existence for nearly twenty-five years, having been organized in May, 1891, under the joint auspices of the Johns Hopkins University, the Maryland Agricultural College, and the United States Weather Bureau. It was established as an official organization by the General Assembly of 1892, the Act being approved by the Governor in April of that year. The State Weather Service under this Act was permanently placed at the Johns Hopkins University, under the direction of a Board of Control nominated by the heads of the three institutions above mentioned, who were subsequently commissioned by the Governor. The appropriation for the maintenance of the Bureau has been \$2,000 annually since its establishment, the fund being employed mainly for investigations relating to the climatology of the state. Professor Clark has been the chief of the Bureau since its organization.

The Weather Service has published, in addition to many small reports and bulletins, three large final volumes, the first dealing with the physiography and meteorology of the state at large, the second with the climate and weather of Baltimore and vicinity, and the third with the distribution of plant life particularly in its relations to climate and soils.

The Weather Service has taken up, under the direction of Professor Livingston, of the Johns Hopkins University, a quantitative study of the results of climatic factors upon vegetation. By growing various cultivated plants at different stations throughout the state under similar soil conditions and keeping a careful quantitative record of their growth, changes, and physiological activity, it is expected that accurate data will be obtained showing the result of the varying climatic conditions on crop production.

THE MARYLAND FORESTRY BUREAU

An Act was passed by the General Assembly of 1906 providing for a State Board of Forestry, to consist of seven members, four of whom are *ex officio* the same as the commissioners of the Geological Survey; the fifth is the State Geologist, while the sixth and seventh are appointed by the Governor. Professor Clark is the executive officer of the board and has been authorized by the board to see that the provisions of the Act are carried out. Mr. F. W. Bealey is the State Forester. Under this Act \$3,500 was appropriated for the first two years and \$4,000 annually for the succeeding four years, while an additional \$1,000 was appropriated by the General Assembly of 1910 to meet the expenses of publication of forestry maps. The Legislature of 1912 greatly increased the resources and powers of the State Board of Forestry by appropriating \$10,000 annually for the general expenses of the board, besides \$50,000 for the purchase of lands in the valley of the Patapsco River in Baltimore and Howard counties for a State Reservation, and \$8,500 for the purchase of old Fort Frederick and the surrounding lands in Washington county. In addition to the above appropriations the sum of \$6,000 was appropriated for the publication of maps and reports, thus rendering available for the two years, 1912-1913 and 1913-1914, the total sum of \$84,500. At the same time provision was made for the establishment of a State Forest Nursery, which is located on land put at the disposal of the Board by the Maryland Agricultural College at College Park. The Legislature of 1914 passed laws, at the suggestion of the Board, providing for the preservation of roadside trees and the planting of shade trees along the highways. At the same time it prohibited the placing of unauthorized signs along the public roads. The administration of these laws is in the hands of the Board.

The State Forester and his assistants have prepared plans for more economical forest management of the woodlands of the State and have on solicitation given advice to a large number of owners of wood lots throughout the State. One of the chief aims of the Forestry Board has been the education of the people of the State in matters pertaining to forest management in order that the growing timber of the State may be utilized to the greatest advantage.

COÖPERATION

Much aid has been rendered the several State bureaus above mentioned by the chiefs of the various Federal bureaus. Particular reference should be made to the coöperation granted by the Director of the United States Geological Survey, the Chief of the United States Coast and Geodetic Survey, the Chief of the United States Weather Bureau, the Chief of the United States Forest Service, and the Chief of the United States Bureau of Soils, all of whom have cordially supplemented the work of the State organizations in many ways. The work of the State organizations is in progress along so many lines that it affords admirable opportunities for the students of the University to obtain much desired practical experience both in the field and in the laboratory, while at the same time the State receives a large return for its outlay.

WM. BULLOCK CLARK.

REPORT OF THE DIRECTOR OF THE BUREAU OF APPOINTMENTS

TO THE PRESIDENT OF THE UNIVERSITY:

I have the honor to present herewith a report of the activities of the Bureau of Appointments of this University from October, 1914, to October, 1915. The report which I made last year covered a period of sixteen months, and although the treasurer's books show the close of the year for the Bureau as July 1, I shall with this present year make my report of the activities of the Bureau run from October to October.

From October 1, 1914, to September 30, 1915, the Bureau wrote to persons outside and inside the University about 700 letters, and sent out some 200 circulars and a number of telegrams. The Bureau has had applications during the year for twice as many teachers as it had been able to make recommendations for, and of the teachers who have been recommended for these positions 20 per cent. were appointed. Of the tutors recommended 100 per cent. were appointed, and in other lines—business, playground director, and so on—the percentage is higher than that of the teachers.

It is to be noted that the appointments made through the Bureau in no wise represent the total number of appointments made from the University. The Bureau serves as a means of helping the various departments, and acts as a clearinghouse and depository of the information about the alumni who have gone out into positions. Whereas all of the inquiries for teachers formerly came directly to the various departments, an increasing number is now coming to the Bureau of Appointments, and it is to be hoped that the advantage which will accrue from a central office, which will list all the available candidates for positions and which can get in immediate touch with the heads of the various departments in regard to recommendations, will make itself of increasing value, and help to establish a uniform method of appointment.

The Bureau writes each year at least one letter to every graduate whom it has helped to place in a position, and tries in that way both to keep in touch with the graduates who have gone out, and also to get information as to positions which are to be filled, suggesting to the graduates that if possible they use their influence to have the proper authority make direct application to the Bureau for a candidate.

The additional registration in the Bureau for the year was 25 undergraduates, 29 graduate students who are now or were at the time of the application still in the University, 13 former graduates, and 7 who may be designated as unclassified.

To this report I append a tabular list of the applications according to subjects and of the appointments. Applications for men

to teach several subjects and the appointments of men to teach several subjects are kept in the file and seem not to merit tabulation.

	Applications	Appointments
Athletics	2	1
Biology	3	1
Education	1	
English	11	
French	2	
Geology	1	
German	3	
Greek	1	1
History	7	
Latin	4	2
Mathematics	8	
Physics	4	
Political Science	1	
Romance languages	1	
Sociology	1	

	Applications	Recommendations	App'tm'ts
Teachers	80	42	8
Athletic directors	2		
Y. M. C. A. secretaries	2	2	1
Demonstrator	1		
Business	4	3	
Playground director	1	1	1
Principals	3	1	
Reader	1	2	2
Tutors	15	15	15

The work of the Bureau, both through its director and the secretary of the Y. M. C. A., in the matter of securing part-time positions for students who are working their way through the University, has made considerable progress during the year. The alumni are beginning to turn more and more to the Bureau when they themselves know of positions or hear of positions which a student could fill with part-time work. The amount of work done by the Bureau has increased perceptibly, and the many letters received from students whom it has helped to put into positions and from the friends of the University show that this work is being appreciated.

R. V. D. MAGOFFIN,
Director.

DEGREES CONFERRED 1914-1915

DOCTOR OF PHILOSOPHY

Mary Emma Armstrong, of Lapeer, Mich., A. B., Olivet College, 1894; A. M., University of Michigan, 1898. *Subjects*: Classical Archaeology, Latin, and History. *Dissertation*: The Significance of Color in Roman Ritual. *Referees on Dissertation*: Professors Robinson and Mustard.

Walter Hatheral Coolidge, of Cincinnati, O., Ph. B., Kenyon College, 1912. *Subjects*: Chemistry, Physical Chemistry, and Geology. *Dissertation*: Osmotic Pressure Measurements of Glucose Solutions at 10° and 20°. *Referees on Dissertation*: Professors Morse and Frazer.

Grace Adelaide Dunn, of Princeton, Minn., Ph. B., Hamline University, 1909; A. M., Johns Hopkins University, 1914. *Subjects*: Botany, Plant Physiology and Physics. *Dissertation*: A Study of the Development of *Dumontia Filiformis*. *Referees on Dissertation*: Professors Johnson and Livingston.

Arthur Feddeman Gorton, of Baltimore, A. B., Johns Hopkins University, 1912, and A. M., 1914. *Subjects*: Physics, Astronomy, and Mathematics. *Dissertation*: Reflection from, and Transmission through, Rough Surfaces. *Referees on Dissertation*: Professors Ames and Pfund.

Kent Roberts Greenfield, of Westminster, Md., A. B., Western Maryland College, 1911. *Subjects*: History, Political Economy, and Political Science. *Dissertation*: Sumptuary Law in Nürnberg: A Study in Paternal Government. *Referees on Dissertation*: Professors Latané and Vincent.

James Eugene Levering Holmes, of Baltimore, A. B., Johns Hopkins University, 1912. *Subjects*: Chemistry, Physical Chemistry, and Applied Electricity. *Dissertation*: The Difference in Chemical Behavior of Free and Combined Water as Illustrated by the Saponification of Esters. *Referees on Dissertation*: Professors H. C. Jones and E. E. Reid.

Marion Byrd Hopkins, of Baltimore, A. B., Johns Hopkins University, 1912. *Subjects*: Chemistry, Physical Chemistry, and Applied Electricity. *Dissertation*: The Chlorides of Orthosulphobenzoic Acid. *Referees on Dissertation*: Professors Remsen and E. E. Reid.

Helen B. Hubbert, of Philadelphia, Pa., A. B., Missouri Valley College, 1907. *Subjects*: Psychology, Physiology, and Education. *Dissertation*: The Effect of Age on Habit Formation in the Albino Rat. *Referees on Dissertation*: Professors Jennings and Dunlap.

Edward Olsen Hulburt, of Baltimore County, Md., A. B., Johns Hopkins University, 1911. *Subjects*: Physics, Astronomy, and Math-

emata. *Dissertation*: The Reflecting Power of Metals in the Ultra-Violet Region of the Spectrum. *Referees on Dissertation*: Professors Ames and R. W. Wood.

Howard Huntley Lloyd, of Baltimore, A. B., Johns Hopkins University, 1912. *Subjects*: Chemistry, Physical Chemistry, and Applied Electricity. *Dissertation*: A Study of the Conductivity of Certain Organic Acids in Absolute Ethyl Alcohol at 15°, 25°, and 35°. *Referees on Dissertation*: Professors H. C. Jones and E. E. Reid.

Forman Taylor McLean, of Eatontown, N. J., Ph. B., Yale University, 1907, and M. F., 1908. *Subjects*: Plant Physiology, Climatology, and Botany. *Dissertation*: A Preliminary Study of Climatic Conditions in Maryland as Related to the Growth of Soy Bean Seedlings. *Referees on Dissertation*: Professor Livingston and Dr. Fassig.

Austin Ralph Middleton, of Baltimore, A. B., Johns Hopkins University, 1910. *Subjects*: Zoology, Plant Physiology, and Botany. *Dissertation*: Heritable Variations and the Results of Selection in the Fission Rate of *Stylonychia Pustulata*. *Referees on Dissertation*: Professors Jennings and Andrews.

Ellis Miller, of Baltimore, A. B., Johns Hopkins University, 1912. *Subjects*: Chemistry, Physical Chemistry, and Applied Electricity. *Dissertation*: A Study of the Vapor Pressure of Aqueous Solutions of Potassium Chloride by an improved Static Method. *Referees on Dissertation*: Professors Frazer and Lovelace.

Thomas Addis Emmet Moseley, of Baltimore, A. B., Johns Hopkins University, 1907. *Subjects*: Italian, French, and Latin. *Dissertation*: The "Lady" in Comparisons from the Poetry of the "Dolce Stil Nuovo." *Referees on Dissertation*: Professor Shaw and Professor Kenneth McKenzie, of Yale University.

Richard Nicholas Mullikin, of Baltimore, A. B., Johns Hopkins University, 1912. *Subjects*: Chemistry, Physical Chemistry, and Geology. *Dissertation*: A Study of the Vapor Pressure of Aqueous Solutions of Mannite by an Improved Static Method. *Referees on Dissertation*: Professors Frazer and Lovelace.

Amos Sentman Musselman, of Gettysburg, Pa., A. B., Pennsylvania College, 1912. *Subjects*: Chemistry, Physical Chemistry, and Applied Electricity. *Dissertation*: Osmotic Pressure Measurements of Glucose Solutions at 30°, 40°, 50° and 60°. *Referees on Dissertation*: Professors Morse and Frazer.

Robert Milton Overbeck, of Govans, Md., A. B., Johns Hopkins University, 1909. *Subjects*: Geology, Petrography, and Chemistry. *Dissertation*: The Copper Ores of Maryland. *Referees on Dissertation*: Professors Clark and Mathews.

Max G. Paulus, of Baltimore, A. B., Johns Hopkins University, 1912. *Subjects*: Chemistry, Physical Chemistry, and Applied Electricity. *Dissertation*: Radiometric Measurements of the Ionization

Constants of Methyl Orange and Phenolphthalein. *Referees on Dissertation*: Professors Morse and H. C. Jones.

Lyde Stuart Pratt, of Farmington, Me., A. B., Bowdoin College, 1912. *Subjects*: Chemistry, Physical Chemistry, and Applied Electricity. *Dissertation*: The Esterification of Benzoic Acid by Mercaptana. *Referees on Dissertation*: Professors E. E. Reid and H. C. Jones.

Willis S. Putnam, of Sterling, Mass., S. B., Worcester Polytechnic Institute, 1889. *Subjects*: Chemistry, Physical Chemistry, and Geology. *Dissertation*: I. The Conductivity and Viscosity of Certain Rubidium and Ammonium Salts in Ternary Mixtures of Glycerol, Acetone and Water at 15°, 25°, and 35°. II. The Conductivity and Viscosity of Solutions of Binary and Ternary Salts in Formamid. *Referees on Dissertation*: Professors Morse and H. C. Jones.

John Bernard Reeside, Jr., of Baltimore, A. B., Johns Hopkins University, 1911. *Subjects*: Geology, Paleontology, and Physical Chemistry. *Dissertation*: The Helderberg and Tonoloway Formations of Central Pennsylvania. *Referees on Dissertation*: Professors Clark and Swartz.

Lindsay Rogers, of Baltimore, A. B., Johns Hopkins University, 1912. *Subjects*: Political Science, Law, and Political Economy. *Dissertation*: The Postal Power of Congress: A Study in Constitutional Expansion. *Referees on Dissertation*: Professors Willoughby and Latané.

Edward Henry Sehrt, of Baltimore, A. B., Johns Hopkins University, 1911. *Subjects*: Germanic Philology, German Literature, and Sanskrit. *Dissertation*: Die Formen der Konjunction *Und* im Westgermanischen. *Referees on Dissertation*: Professors Collitz and H. Wood.

Emily Ledyard Shields, of Nashville, Tenn., A. B., Bryn Mawr College, 1905. *Subjects*: Classical Archaeology, Greek, and Latin. *Dissertation*: Cults of Lesbos. *Referees on Dissertation*: Professors Robinson, Gildersleeve, and Miller.

John Wesley Shive, of Baltimore, Ph. B. and A. M., Dickinson College, 1906. *Subjects*: Plant Physiology, Botany, and Chemistry. *Dissertation*: A Study of Physiological Balance in Nutrient Media Resulting in a Simplified Culture Solution for Plants. *Referees on Dissertation*: Professors Livingston and H. C. Jones.

Clarence Piersall Sousley, of Winchester, Ky., A. B., Kentucky Wesleyan College, 1909. *Subjects*: Mathematics, Astronomy, and Exploratory Surveying. *Dissertation*: Invariants and Covariants of the Cremona Hexahedral Form of the Cubic Surface. *Referees on Dissertation*: Professors Morley and Coble.

Ruth Jennings Stocking, of Burton, O., A. B., Goucher College, 1910. *Subjects*: Zoology, Psychology, and Botany. *Dissertation*: Inheritance and Variation in Abnormalities Occurring after Conjugation in *Paramecium Caudatum*. *Referees on Dissertation*: Professors Jennings and Andrews.

Benjamin Franklin Wallis, of Baltimore, A. B., Johns Hopkins University, 1910. *Subjects*: Geology, Economic Geology, and Physical Chemistry. *Dissertation*: The Geology and Economic Value of the Wapanucka Limestone of Oklahoma. *Referees on Dissertation*: Professors Clark and H. F. Reid.

Charles Watkins, of Lexington, Va., A. B., Washington and Lee University, 1909; M. S., Vanderbilt University, 1911. *Subjects*: Chemistry, Physical Chemistry, and Mineralogy. *Dissertation*: The Conductivity, Percentage Dissociation and Temperature Coefficients of Some Rather Unusual Salts in Aqueous Solution. *Referees on Dissertation*: Professors Morse and H. C. Jones.

William Oswald Weyforth, Jr., of Baltimore, A. B., Johns Hopkins University, 1912. *Subjects*: Political Economy, Political Science, and Mathematics. *Dissertation*: The Organizability of Labor. *Referees on Dissertation*: Professors Hollander and Barnett.

Tomikichi Yokoyama, of Shimoda, Japan, Ph. B., Kansas City University, 1909. *Subjects*: Political Science, Political Economy, and Philosophy. *Dissertation*: The Japanese Judiciary: Its Historical Development and Present Organization. *Referees on Dissertation*: Professors Willoughby and Latané.

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DOCTOR OF MEDICINE

Frank Earl Adair, of Beverly, O., A. B., Marietta College, 1910.

Harvey Montreville Andrew, of Deer Lick, Pa., S. B., Wayneburg College, 1911.

Charles Armstrong, of Alliance, O., S. B., Mount Union College, 1910.

Dana Winslow Atchley, of Asbury Park, N. J., S. B., University of Chicago, 1911.

John Aull, of Lexington, Mo., A. B., University of Virginia, 1911.

Arthur Maynard Bacon, of Westminster, Md., A. B., Western Maryland College, 1911.

John Cook Baldwin, of Baltimore, S. B., Hamilton College, 1910.

Margaret Dietz Batchelor, of Hazleton, Pa., A. B., Wellesley College, 1907.

Roger Putnam Batchelor, of Milwaukee, Wis., A. B., University of Wisconsin, 1911.

Harold Edward Bates, of Portland, Ore., A. B., University of Oregon, 1910.

Leo Chapman Bean, of Gallipolis, O., Ph. B., Ohio University, 1911.

Louis de Keyser Belden, of Wilmington, N. C., S. B., University of North Carolina, 1910.

George Braunlich, of Davenport, Ia., Ph. B., University of Chicago, 1910.

Walter C. Burket, of Kingman, Kans., S. B., University of Chicago, 1911.

Frederick Christopher, of Evanston, Ill., S. B., Northwestern University, 1911.

Admont Halsey Clark, of Miyazaki, Japan, A. B., Oberlin College, 1910.

Jefferson Hamer Clark, Jr., of Philadelphia, Pa., A. B., Haverford College, 1911.

Samuel Wolcott Clausen, of Canandaigua, N. Y., A. B., Williams College, 1910.

Harry Duffield Clough, of New Bedford, Mass., A. B., Brown University, 1908.

Rena Crawford, of Columbus, Miss., Ph. B., University of Chicago, 1903.

Robert Sydney Cunningham, of Anderson, S. C., S. B., Davidson College, 1911.

Arthur Bliss Dayton, of Naugatuck, Conn., Ph. B., Yale University, 1911.

Beeckman J. Delatour, of Brooklyn, N. Y., S. B., Amherst College, 1911.

Woods Frederick Derr, of Watsontown, Pa., A. B., Bucknell University, 1911.

Drayton Howard Doherty, of Selma, Ala., A. B., Howard College, 1910.

DuMont F. Elmendorf, of New Brunswick, N. J., A. B., Rutgers College, 1911.

Roy Edwin Fallas, of Los Angeles, Cal., A. B., Leland Stanford Jr. University, 1911.

Otto Alois Faust, of Schenectady, N. Y., Ph. B., Union College, 1911.

Herbert Spencer Gasser, of Plattville, Wis., A. B., University of Wisconsin, 1910.

William Carson von Glahn, of Wilmington, N. C., S. B., Davidson College, 1911.

Samuel James Glass, Jr., of Pittsburgh, Pa., S. B., University of Pittsburgh, 1911.

William Mayes Gober, Jr., of Marietta, Ga., A. B., University of Georgia, 1909.

Calvin Hooker Goddard, of Baltimore, A. B., Johns Hopkins University, 1911.

Lewie Muller Griffith, of Columbia, S. C., S. B., University of South Carolina, 1908.

Roy Griffith, of Bogart, Ga., S. B., University of Georgia, 1911.

Russell Landram Haden, of Crozet, Va., A. B., University of Virginia, 1910.

William Morris Happ, of Macon, Ga., A. B., University of Georgia, 1911.

Vernon Offutt Heddens, of St. Joseph, Mo., A. B., University of Missouri, 1910.

Frank M. Houck, of Bolling Springs, Pa., Ph. B., Dickinson College, 1910.

Stewart Vernon Irwin, of Oakland, Cal., S. B., University of California, 1911.

Morris Joseph, of Passaic, N. J., S. B., New York University, 1911.

Floyd Wilcox McRae, Jr., of Atlanta, Ga., Ph. B., Yale University, 1911.

Hertel Philip Makel, of Baltimore, A. B., Johns Hopkins University, 1911.

Verne Rheem Mason, of Long Beach, Cal., S. B., University of California, 1911.

Kenneth Fuller Maxcy, of Baltimore, A. B., George Washington University, 1911.

McDugald Keener McLean, of Wolfe City, Tex., A. B., Southwestern University, 1908.

James Robert McVay, of Trenton, Mo., A. B., University of Mississippi, 1912.

David Ralph Melen, of Rochester, N. Y., S. B., University of Rochester, 1911.

James Samuel Mitchener, of Salem, N. C., S. B., Davidson College, 1909.

Thomas Verner Moore, of Washington, D. C., Ph. D., Catholic University of America, 1903.

Harold Sidney Morgan, of San Diego, Cal., A. B., Leland Stanford Jr. University, 1912.

Rufus Ayres Morison, of Big Stone Gap, Va., Virginia Military Institute, 1906.

John Gardner Murray, Jr., of Baltimore, A. B., Johns Hopkins University, 1911.

Harvey Huston Musser, of Akron, O., A. B., Johns Hopkins University, 1911.

Harris Sidney Newcomer, of Washington, D. C., A. B., University of Wisconsin, 1909.

Thomas Christian Peightal, of Altoona, Pa., Ph. B., Franklin and Marshall College, 1911.

George Heinrichs Preston, of Baltimore, A. B., Johns Hopkins University, 1911.

Mary Putnam, of New York, N. Y., A. B., Bryn Mawr College, 1910.

George Kremer Rhodes, of Berkeley, Cal., S. B., University of California, 1913.

David Neepier Richards, of Germantown, Md., A. B., University of Wooster, 1911.

Esther Loring Richards, of Sherborn, Mass., A. B., Mt. Holyoke College, 1910.

Thomas Milton Rivers, of Jonesboro, Ga., A. B., Emory College, 1909.

Gilbert White Rosenthal, of Baltimore, A. B., Johns Hopkins University, 1910.

Lippman Leonard Rothschild, of Buffalo, N. Y., A. B., Yale University, 1910.

Adolph George Schnack, of Honolulu, H. I., A. B., Leland Stanford Jr. University, 1910.

Katharine Julia Scott, of Pittsfield, N. H., A. B., Wellesley College, 1910.

Judd Campbell Shellito, of Independence, Ia., S. B., Princeton University, 1911.

Daniel Marsh Shewbrooks, of Holden, Mass., A. B., Middlebury College, 1909.

Harvey M. Slater, of Salem, Ore., A. B., University of Oregon, 1911.

Daniel Clarke Wharton Smith, 2d, of Roland Park, Md., Ph. B., Yale University, 1911.

John Frederick Smith, of Cedar Falls, Ia., A. B., Lake Forest University, 1907.

Lucius Ernest Smith, of Lexington, Ky., S. B., University of Kentucky, 1911.

L. Howard Smith, of Huron, S. Dak., S. B., Huron College, 1910.

Mary Hannah Swan, of Tecumseh, Mich., A. B., Mt. Holyoke College, 1905.

Virgil Preston Willis Sydenstricker, of West Point, Miss., A. B., Washington and Lee University, 1910.

Benjamin Tappan, of Baltimore, A. B., Johns Hopkins University, 1911.

William Clark Thomas, of Bartow, Ga., A. B., Emory College, 1911.

Donald Vaughn Trueblood, of Seattle, Wash., A. B., University of Washington, 1911.

Prescott Stearns Tucker, of Washington, D. C., A. B., George Washington University, 1911.

John Calvin Turner, Jr., of Camilla, Ga., S. B., Davidson College, 1908.

Victor Roland Turner, of Newark, O., S. B., Denison University, 1909.

John Edward Walker, of Alexander City, Ala., S. B., Alabama Polytechnic Institute, 1910.

Charles Luther Warner, of Baltimore, A. B., Johns Hopkins University, 1911.

Roy Gillilan Werner, of Columbus, O., A. B., Ohio State University, 1909.

Lawrence Richardson Wharton, of Hollywood, Cal., Ph. B., Hiram College, 1907.

Henry Stafford Whisman, of Salinas, Cal., S. B., University of California, 1911.

Louis Hicks Williams, of Faison, N. C., A. B., University of North Carolina, 1911.

Edward Blaine Wix, of New York, N. Y., Ph. B., Yale University, 1911.

F. Simon Woo, of Chang Chow, China, A. B., St. John's University, Shanghai, 1910.

MASTER OF ARTS

Jack Holman Clarke, of Axton, Va., A. B., Presbyterian College (S. C.), 1905; B. D., Union Theological Seminary (Va.), 1908, *Subject*: Philosophy. *Essay*: The Meaning and Motivation of James's Pragmatism, with Some Critical Comments. *Referees on Essay*: Professors Lovejoy and Griffin.

Teresa Cohen, of Baltimore, A. B., Goucher College, 1912. *Subject*: Mathematics. *Essay*: Preliminaries to the Obtaining of a Conic determined by a Line and the Four Tangents at its Intersections with a Plane Quartic. *Referees on Essay*: Professors Morley and Coble.

Robert William Dickey, of Covington, Va., S. B., Washington and Lee University, 1910, and A. B., 1911. *Subject*: Physics. *Essay*: The Structure of the Atom. *Referees on Essay*: Professors Ames and Anderson.

James Neville Galloway, of Berryville, Va., A. B., Randolph-Macon College, 1908. *Subject*: Mathematics. *Essay*: On the Four-Line of Given Shape. *Referees on Essay*: Professors Morley and Cohen.

James Fullerton Gressitt, of Baltimore, A. B., Johns Hopkins University, 1906. *Subject*: Education. *Essay*: The Reorganization of Secondary Education. *Referees on Essay*: Professors Buchner and Dunlap.

William Brant Hughes, of Wilmore, Ky., B. Ped., Ohio Northern University, 1903, and A. B., 1909. *Subject*: Physics. *Essay*: Analysis of Sound Waves. *Referees on Essay*: Professors Ames and Anderson.

Buford Jennette Johnson, of Thomson, Ga., A. B., LaGrange College, 1905. *Subject*: Education. *Essay*: Sex Differences in Learning. *Referees on Essay*: Professors Buchner and Dunlap.

Herbert Hayes Murphy, of Glyndon, Md., A. B., Western Maryland College, 1897. *Subject*: Education. *Essay*: Distribution of Practice Periods in Learning. *Referees on Essay*: Professors Buchner and Watson.

James Burness Rather, of College Station, Texas, S. B., Texas Agricultural and Mechanical College, 1907. *Subject*: Chemistry. *Essay*: Esters of Phosphoric Acid. *Referees on Essay*: Professors E. E. Reid and H. C. Jones.

Joe Kent Roberts, of Saltville, Va., A. B., Emory and Henry College, 1910. *Subject*: Geology. *Essay*: Phosphates,—their Distribution, Occurrence, Genesis and Character. *Referees on Essay*: Professors Mathews and Berry.

William Carl Spielman, of Cincinnati, O., A. B., University of Cincinnati, 1905. *Subject*: History. *Essay*: Trade Relations of Ohio, 1803-1870. *Referees on Essay*: Professors Latané and Vincent.

Edith Viola Thompson, of Baltimore, A. B., Goucher College, 1909. *Subject*: Mathematics. *Essay*: The Lemniscate. *Referees on Essay*: Professors Morley and Cohen.

BACHELOR OF ARTS

William Addison Baker, Jr., of Baltimore.
Moses Baroway, of Baltimore.
Joseph Thomas Bartlett, Jr., of Oxford, Md.
Daniel Benton Biser, of Parkersburg, W. Va.
Arthur Edward Brooks, of Baltimore County, Md.
Leopold Clarence Cohn, of Baltimore.
Raymond Kenmore Cole, of Baltimore.
Charles Everard Deems, of Baltimore.
John DeWitt, of Baltimore County, Md.
Franklin Gessford Ebaugh, of Baltimore County, Md.
Millard Eiseman, of Baltimore.
Frank Rodolph Ford, of Baltimore.
George Martin Hall, of Baltimore.
Andrew Henry Hilgartner, of Baltimore.
Joel Gutman David Hutzler, of Baltimore.
Charles William Levinson, of Baltimore.
Norman C. Lindau, of Baltimore.
William Spedden Merrick, of Baltimore.
Norman Clive Nicholson, of Baltimore.
Alfred Salem Niles, Jr., of Baltimore.
Alvin Thomas Perkins, of Baltimore.
Edmund Howard Prince, of Baltimore County, Md.
Benjamin Sacks, of Baltimore.
John Saulsbury Short, of Baltimore.
Rush Wiley Smith, of Howard County, Md.
Emmette Rigdon Spencer, of Baltimore.
Harold J. Stewart, of Onancock, Va.
Joel Howard Swartz, of Baltimore.
Frederick Courtney Tarr, of Baltimore.
Stephen Ignatius Thompson, of Baltimore.
Henry Ernest Treide, of Baltimore.
Thomas Franklin Troxell, of Baltimore.
Claud Irving Uhler, of Baltimore.
Allen Fiske Voshell, of Baltimore County, Md.
Avra Melvin Warren, of Howard County, Md.
Charles Sewell Weech, of Baltimore.

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BACHELOR OF SCIENCE IN ENGINEERING

James Stanley Gorsuch, of Baltimore County, Md., S. B., Maryland
Agricultural College, 1909.
James Maynard Lednum, of Caroline County, Md., S. B., Maryland
Agricultural College, 1912.
Abel Wolman, of Baltimore, A. B., Johns Hopkins University, 1913.

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JOHNS HOPKINS UNIVERSITY CIRCULAR, No. 281

JANUARY, 1916

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THE
JOHNS HOPKINS
UNIVERSITY CIRCULAR

1917

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1917

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THE

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EDITED BY

THOMAS R. BALL

REPORT OF THE PRESIDENT
OF THE UNIVERSITY

1915-16



BALTIMORE, MARYLAND

PUBLISHED BY THE UNIVERSITY

ISSUED MONTHLY FROM OCTOBER TO JULY

JANUARY, 1917

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ANNUAL REPORT
OF
THE PRESIDENT OF
THE JOHNS. HOPKINS UNIVERSITY
1915-16



BALTIMORE
THE JOHNS HOPKINS PRESS
1917

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ANNUAL REPORT OF THE PRESIDENT

TO THE TRUSTEES OF THE JOHNS HOPKINS UNIVERSITY:—

Gentlemen:

I have the honor to submit to you my second annual report as President of the University for the academic year ending September 30, 1916. Attached to this report are the reports from the different departments of the University which contain a statement both of the work done during the past year and of some of our most pressing needs.

These reports show that the work of the University has been carried on satisfactorily during the past year. Indeed the year that has closed has been one of distinct accomplishment. The University has always regarded research as its chief function. The past year has been marked by the completion of several more than ordinarily interesting investigations. Messrs. Morse, Frazer, Miller and Holland, members of the staff of the Department of Chemistry, have invented a process, for which a patent has been granted, by means of which the production of sulphate of alumina and potash from feldspar is made a commercial possibility. That this discovery will have an important bearing on the economic life of the country seems to be probable.

Professor Jennings, in the Department of Zoology, has finished a most interesting series of experiments which demonstrate that racial differentiation is occurring slowly and gradually in certain organisms as generations pass, quite independently of biparental reproduction.

In the Engineering Department important work has been carried on by Mr. David T. Day, of Washington, assisted by members of the staff of the Department of Mechanical Engineering. This work has yielded important results in the cracking of petroleum vapors by subjecting them to a high compression and temperature in a Diesel engine.

In this department also the United States Navy Department has been making use of our equipment in an extended investigation of means for determining the capacity of blowers and other air-supplying apparatus used on war vessels. The results of this investigation, which have already yielded valuable scientific data, will be published in the *Journal of the American Society of Naval Engineers*.

The instances which I have enumerated are but examples of the work which has been done and which is set forth at length in the separate departmental reports. A perusal of these reports with the appended bibliographies will show that the University is carrying on with unabated vigor the work which has for so long a time been associated with it in the public mind.

HOMEWOOD

In my last report I expressed the belief that with the construction of the Civil Engineering Building the principal work of the University could, with advantage, be moved to the new site at Homewood. This belief I am glad to say was not a vain one. The department of Physics has been housed in the Mechanical and Electrical Engineering Building, the departments of Zoology and Botany and part of the department of Psychology in the Academic Building, and the department of Geology and the State Bureau of Geological

Survey in the Civil Engineering Building. The work of the State Forestry Bureau and Weather Service will, however, be carried on for the time being at North Howard Street. Accommodation has also been found for the administrative offices of the University, including the offices of the Treasurer, in the new Academic Building. Provision has finally been made for the undergraduate work in Chemistry at Homewood. A lecture room has been made available in the Civil Engineering Building, and the necessary laboratory work will be carried on in the South wing of the Mechanical and Electrical Engineering Building, in the quarters on the ground floor hitherto assigned to the department of Civil Engineering. The expense of fitting up this room for its new uses will be defrayed in large part from a fund which Mr. J. E. Aldred has generously placed at the disposition of the University.

CHEMICAL LABORATORY

The only part of the work of the University which will continue for the present to be carried on at the old site on North Howard Street is the graduate work in Chemistry. It is perhaps unnecessary to call the attention of the Trustees to the need of a new chemical laboratory at Homewood. This need is due not only to the desirability of concentrating our work at our new site, but as well to the fact that the facilities for work at the old site have become inadequate. The importance of work in Chemistry, particularly in the training of persons competent to carry on research, is daily becoming more and more apparent. The relief which the department will obtain by reason of the removal of the undergraduate work to Homewood can be regarded only as temporary in character. Adequate quarters must in the near future be provided, if the University is to retain the position in chemical work which it has occupied ever since its foundation, forty years ago.

It is useless for us to expect that we can by any further adjustments provide for the Department of Chemistry in any

of the buildings now at Homewood. Indeed the present arrangements at the new site have been made possible only because of the willingness of the teaching force to submit to a curtailment of space which they had been led to expect would be available. Without the spirit of coöperation which has been manifested by all of the officers of the University, the various adjustments and readjustments which have been necessary would have been impossible. Particular mention should be made of the admirable work done by our Librarian, Dr. Raney, who planned and supervised the arrangements for moving not only the library but most of the articles which had to be brought to Homewood from McCoy Hall. His foresight and efficiency have made it possible for us to move to our new site with a minimum of friction and inconvenience.

STUDENTS' BUILDING

Another feature of the development at Homewood to which I wish to call attention is the remodeling of the old Carroll stable, one of the historical landmarks at our new site. One of the most perplexing problems which the move to Homewood presented for solution, was provision for the student body, for whom nothing had been arranged to take the place of Levering Hall at the old site. Dean Brush was convinced that a comparatively slight expenditure would make the old Carroll stable an attractive and reasonably commodious Student Activities Building. He took upon himself the responsibility of providing, through appeals to the Alumni, the necessary funds, and work was begun during the summer. It is hoped that before the beginning of the second term students will have a place in which they may feel a more intimate sense of proprietorship than is possible in the case of any of our other buildings.

JOHNS HOPKINS CLUB

Finally, our removal to Homewood has had as one of its incidents the transfer of the Hopkins Club to the Carroll

Mansion. There the Club will minister, as in the past, to the needs of the members of the faculty who live too far from the University to permit them to return to their homes at mid-day. It is also hoped that the attractive quarters in which the Club is now housed, together with the facilities for athletic sports, due to its situation at the University, will appeal to our local alumni. Their presence in greater numbers at the University cannot fail to be of advantage both to them and to those engaged in University work.

MEDICAL SCHOOL

The change in the physical conditions of the University have not, however, been confined to Homewood. The completion of the new Hunterian Laboratory at the Medical School, made possible by a gift from the General Education Board, the opening of new wards in the Harriet Lane Home at the Hospital, due to gifts from the citizens of Baltimore, and the changes in the quarters of the department of Medicine made possible by the generous action of Mr. Kenneth Dows, in giving us the Dows Tuberculosis Research Fund, will make the medical work of the University much more effective than it otherwise could have been. Particularly are we to be congratulated because of the fact that the completion of the Hunterian Laboratory makes possible the housing of the Medical School Library in fireproof quarters.

NEEDS OF THE UNIVERSITY

In my last report I called attention to what seemed to me to be the two most pressing needs of the University, viz., an increase in the lower salaries paid and in the facilities offered for carrying on research. These two needs press upon us with increasing insistence. The recent increase in the cost of living has made much more difficult the principal problem to be solved by the salaried man, and has as a result made certain salary increases absolutely necessary. The developments of the past year have also brought into even clearer

relief the necessity for encouraging research along many lines. I am glad to say that it has been possible during the past year to make some, though still inadequate, provision for this line of work.

EXPANSION OF UNIVERSITY ACTIVITY

The generosity of the friends of the University in the City of Baltimore has made it possible for us to enter, during the coming year, several new fields of activity.

Mr. Henry E. Treide, one of our Alumni of the class of 1904, became convinced that there was the same need for instruction in Business Economics in Baltimore as in other commercial cities, where of late years Schools of Business or Commerce have been established, often in connection with the local University. He was able to interest a number of the business men of the city in the project. After the plan had been approved by the Trustees, arrangements were made for the opening of such courses to be given in the evening during the coming year.

It was also felt by some of those interested in the industrial development of Baltimore that the University would render a service to the local community by offering evening classes in the Engineering branches for those who were unable to attend the regular day courses. Provision has accordingly been made for evening courses in the different branches of Engineering and in Chemistry, Physics, and Mathematics.

The finances of the University made it impossible for it to enter upon these undertakings without assistance. This assistance was, however, accorded to us through the generosity of the business men of the city, who by this action have made it possible for us to attempt to render a local service, which without their coöperation would have been beyond our powers.

SCHOOL OF PUBLIC HEALTH AND HYGIENE

Announcement was made on our last Commencement day that the Rockefeller Foundation had resolved to establish, as

a branch of the University, the new School of Public Health and Hygiene, the founding of which it had for some time been contemplating. The choice by the Foundation of the Johns Hopkins University as the institution of which the new school was to be a component part, is necessarily for us a source of great gratification. It not only has caused us all to find that the confidence we had in the excellence of the work we were doing had not been misplaced. It has as well marked another step in the carrying out of the program adopted in 1910 for the expansion of our work.

CARRYING OUT OF 1910 PROGRAM

It is interesting at this time to note how nearly we have succeeded in completing the 1910 program. We have moved to the new site; we have established the Engineering School; we hope to have the School of Public Health and Hygiene in operation next year, though the new building for it on Monument Street, opposite the Medical School, will not probably be ready for another year. We have not as yet technically a Training School for Teachers. We have, however, in the Summer courses and in the College Courses for Teachers what is almost the equivalent of such a school. The attendance on these courses is continually increasing. More and more attention is being given to the more technical side of the subject of Education, and it is not unreasonable for us to expect that we shall shortly be able to do for the teachers in the schools of the City and of the State what it was hoped we should do when the 1910 program was formulated.

In fact we are justified in saying that we have realized the 1910 program, so far as concerns its educational features, with the single exception that as yet no steps have been taken for the establishment of the School of Jurisprudence, which, it will be remembered, was one of the items in that program. The establishment of such a school must wait for an adequate endowment. It is useless for us even to entertain the hope that a School of Jurisprudence may be organized in the University, until its resources have been greatly increased.

FINANCIAL STATEMENT

The Financial Report, showing in detail the operations for the year ending June 30, 1916, and the condition of the University finances on that date, has been published, and copies may be obtained from the Treasurer by those interested. Reference to this report will reveal the following facts:

INCOME AND EXPENSE FOR THE YEAR

The operations of the year resulted in an excess of expenditures over income of..		\$71,925.59
On Philosophical and Collegiate account..	\$43,368.95	
and on Medical School Account.....	28,556.64	
		<hr/>
The excess for the preceding year was....		64,115.55
For Philosophical and Collegiate Departments	\$41,188.12	
For the Medical School.....	22,927.43	
		<hr/>
An increase this year of.....		\$7,810.04
It will be noted that the deficit on the Philosophical and Collegiate account increased during the year as compared with the year before.....		2,180.83
And the deficit in the Medical School increased		\$ 5,629.21
		<hr/>
Making a net increase as above of.....		7,810.04
		<hr/>
The total income from operations for the year was....	\$565,699.50	
An increase this year of.....		44,493.81
This increase came from the following sources:		
Tuition	\$ 2,160.70	
Income from Invested Funds	22,215.69	
State of Md. Engineering School Appropriation...	4,903.53	
Other items, of which \$11,319.47 is accounted for by a consideration for the first time of the gross receipts from the Summer Courses, the net receipts only having heretofore been carried to the general receipts account....	15,213.89	

Of the total income, the amount received from students was twenty-three per cent., the income from invested funds fifty-seven per cent., from the State of Maryland twelve per cent., and from other items eight per cent.

The total operating expenses for the year were..... \$637,625.09

A net increase for the year of..... \$52,303.85

The increase is accounted for as follows:

In salaries.....	\$45,723.84
In expenses.....	11,635.59

\$57,359.43

Less decrease

In apparatus and books	\$4,795.58
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In other items....	260.00	5,055.58
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\$52,303.85

The amount paid for salaries during the year constituted sixty-nine per cent. of the total expenses, the amount paid for expenses twenty-nine per cent., and the amount paid for apparatus, equipment, and for other items two per cent.

From the foregoing figures it will be seen that the expenses of the University are growing faster than the income, which was already inadequate, and that the annual excess of expenditures over income, which should be extinguished, or at least diminished, is increasing. The total accumulated deficits from operation to June 30, 1916, were \$334,331.58.

The gratifying increase in the income of the University shown in the statement above set forth, is largely due to gifts for special purposes, the fulfillment of which has necessitated larger expenditures. The result has been that while the sphere of our activity has been enlarged, our general budgetary situation has not been greatly relieved.

I am glad to be able to say that the situation will be improved this coming year. It is apparent that receipts from tuition fees will be larger than heretofore, and that this item of increase will not be altogether offset by increased expenditures.

Furthermore, and what is much more important, a successful appeal has been made both to our Alumni and to the friends of the University in the City of Baltimore to make provision for taking care of the current deficit in operation during the next three years. We have also received during the past year a considerable addition to our permanent general endowment.

The University is, consequently, in a much better financial position than it has been for a number of years. I hope that the current operations of the coming year will show little, if any, deficit, notwithstanding the fact that the State's appropriation for the general purposes of the University was considerably reduced by the last legislature.

GIFTS AND BEQUESTS

The past year has been a favorable one for the University as regards the gifts and bequests which it has received. It has been made the beneficiary under two wills, in accordance with which it hopes to receive quite large sums. Miss Jessie Gillender, of New York, bequeathed to us \$150,000. The clause in Miss Gillender's will which contained the bequest expresses the hope that "others with greater means at their disposal, either in augmentation of this fund, or in separate funds for the same purpose, will make further and larger gifts to the Trustees of the Johns Hopkins University, Baltimore, Maryland, for the purpose of investigation into the cause, prevention, and cure of the baffling and terrible disease, epilepsy, in memory of my late sister, Carrie Gillender, to be known as 'The Epilepsy Medical Research Fund.'"

During the summer the University lost a great friend by the death of Mr. John Black, of Baltimore. Mr. Black had many times before his death manifested his interest in the Hopkins. His will showed that that interest he retained to the last. The University was given by him a legacy of \$50,000 and a fifth interest in his residuary estate. This be-

quest will be available for the general purposes of the University.

Mr. Kenneth Dows, of New York, has during the past year made an agreement with the University by which he will give \$17,500 a year for five years, beginning September 1st, 1916. The money contributed is to be known as "The Dows Tuberculosis Research Fund," and used for research in tuberculosis under the direction of the medical staff. In addition to the fund mentioned, Mr. Dows has also arranged to give \$6,500 to defray the cost of remodeling and equipping the laboratory for the Tuberculosis Research work.

Mr. James E. Aldred, of New York, has promised to give to the University for the furtherance of practical instruction in Engineering the sum of \$5,000 a year for five years.

An anonymous donor has promised \$5,000 a year for five years for the department of Art as Applied to Medicine, in the Medical School.

Mr. Henry Phipps, of New York, gave \$8,500 to meet the expenses of instruction in the department of Psychiatry of the Medical School, which conducts the Phipps Clinic.

A fund, amounting to \$6,000 in money and equipment, for the installation of a Gas By-product Recovery Laboratory, has been raised by the contributions of the following companies and persons:—American Gas Company; Consolidated Gas Company of New York; Montreal Light, Heat, and Power Co.; Consolidated Gas Company of Baltimore; United Gas Improvement Company; Laclede Gas Light Company; People's Gas Light and Coke Company; Milwaukee Coke and Gas Company; Bartlett, Hayward & Company; United Gas Improvement Company; Mr. F. H. Wagner, of Baltimore.

The estate of the late Miss Frances Wilson, of New York, was divided between the life tenant and the remaindermen, the University receiving, as one of the remaindermen, a bequest of \$7,361.55, in memory of the late Frederick Danne. This bequest was made for the general uses and purposes of the University.

A group of gentlemen, headed by Mr. Richard J. White, of Baltimore, contributed \$2,500 for lectures in Biblical History.

Mr. Graffin Cook, of Baltimore, gave \$1,000 towards the installation of the chimes in the tower of the Academic Building.

Mr. and Mrs. Lawrence Turnbull, of Baltimore, gave \$1,000 for "The Percy Graeme Turnbull Memorial Lecture-ship on Poetry."

Mrs. Charles E. Dohme has made provision for a lecture-ship, to be known as "The Charles E. Dohme Memorial Lectureship," to be devoted to the chemical problems connected with pharmacology.

The Alumni Association of the Friends' School gave \$1,250 to establish a scholarship of \$50.00 per year, in memory of the late Professor Eli M. Lamb, of Baltimore. The Trustees, in accepting the fund, voted to add \$50.00 per year, in tuition, to the scholarship, so that the holder might receive the equivalent of \$100 per year.

Mr. Percy Pyne, of New York, gave \$500, and Mr. E. L. Taylor, of New York, gave \$100, to purchase apparatus for "The Heart Station" of the department of Medicine.

Several alumni, viz., Messrs. W. F. Bissing, C. R. Crum, W. H. Maltbie, A. H. Wilson, Teresa Cohen, H. A. Bumstead, H. Taber, F. Cajöri and T. E. McKinney, have started a fund to be known as the "Fabian Franklin Fund" in the department of Mathematics.

Several other alumni and friends of the University have contributed towards defraying the expense of an instructor in the department of Mathematics.

Mrs. Henry Lee Smith gave \$100 for the "Joseph Kernochan Garr Scholarship," for the purpose of aiding a student of the Medical School, found to be most deserving, and who has completed his first year's work in Medicine.

Dr. Albert Shaw, an alumnus of this University, gave \$250 for the honorarium of the annual lectures on "Diplomatic History."

An anonymous donor gave \$125 for lectures in International Law, by Dr. James Brown Scott.

Mr. J. Huiskamp provided the honorarium for a lecture in the department of German given by Rev. Julius Hofmann.

Dr. A. R. L. Dohme, Messrs. L. Muller, C. H. Koppelman, and E. Schmeisser gave the honorarium for the lectures delivered by Professor Bonn, of the University of Munich.

Mrs. David L. Bartlett gave \$100 towards the publication of *Modern Language Notes*.

Mr. Charles S. Field contributed \$75 for books for the library, this contribution having been set aside from the George von Lingen estate.

The Board of Trade of Baltimore, through its President, Mr. B. H. Griswold, Jr., gave \$88.15 as a contribution for the purchase of apparatus in Civil Engineering.

A contribution of \$69.40 was given anonymously, through Dr. J. S. Ames, for books in scientific literature.

Mr. E. E. Free made a contribution to take care of the expense of employing an Assistant in the department of Plant Physiology.

A portrait in oil of Professor Henry Wood was presented to the University by some of his friends and former pupils.

Mrs. Clara N. Pacholder has presented to the University for the Oriental Seminary an oil painting of "An Orthodox Jew at Prayer."

Finally, and what is of the greatest importance, successful appeal has been made to the friends of the University in Baltimore for contributions for a period of three years to a maintenance fund, which will enable the University to continue its work on its present lines. Annual payments of nearly \$70,000 during the three-year period have been promised by the following subscribers:—

L. T. Appold, Summerfield Baldwin, J. Kemp Bartlett, John R. Bland, Thomas H. Bowles, S. Proctor Brady, Alexander Brown, Mrs. Laura E. Buck, James Carey, James Carey, Jr., Mrs. Thomas K. Carey, E. Asbury Davis, A. R. L. Dohme, A. E. Duncan, the Misses Eaton, Jacob Epstein, Frank A. Furst, Robert Garrett, James A. Gary, Douglas H.

Gordon, Hochschild, Kohn & Co., C. C. Homer, The Hub, E. B. Hunting, Abram G. Hutzler, Richard N. Jackson, M. E. Jenkins, Francis M. Jencks, R. Brent Keyser, George W. Knapp, Charles H. Koppelman, Eugene Levering, Julius Levy, William Levy, Seymour Mandelbaum, George K. McGaw, William A. Marburg, Ferdinand C. Meyer, Edgar G. Miller, John Gardner Murray, Isaac F. Nicholson, E. L. Norton, William B. Oliver, Blanchard Randall, William C. Rouse, M. Samuels, Charles O. Scull, J. E. Sperry, John T. Stone, Francis A. White, Miles White, Jr., Richard J. White, Daniel Willard, George R. Willis, and others who gave anonymously.

ASSETS AND LIABILITIES

(June 30, 1916)

The University has Assets as follows:

Stocks, Bonds, Productive Real Estate, etc., belonging to Endowment Funds	\$5,952,663.84
Bonds, etc., belonging to Special Funds	110,000.00
Plant, Equipment, etc.—	
Howard St. Buildings.....	\$ 990,189.16
Medical School Buildings.....	187,028.34
Homewood Land and Development..	2,113,563.76
New Hunterian Laboratory.....	67,926.51
Equipment, Books, etc.....	633,461.53
	<hr/>
	3,992,169.30
Accounts receivable.....	126,407.85
Cash on hand.....	26,449.82
	<hr/>
<i>Making Total Net Assets (Book Value)</i>	<i>\$10,207,690.81</i>
Corresponding to Liabilities, i. e., Funds and Balances, as follows:	
Permanent Endowments (Trust Funds):	
Funds Consolidated for investment	\$4,956,681.47
Funds separately in- vested	1,411,411.94
	<hr/>
	\$6,368,093.41
Unexpended Income of Special Funds..	53,298.88
Sundry Open Accounts.....	99,872.81
Engineering School Building Fund...	148,350.89
Bills Payable.....	75,000.00
	<hr/>
	\$6,744,615.99
<i>Leaving</i>	<i>\$3,463,074.82</i>

Assets and Liabilities

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Which is represented by—

Plant, Equipment, etc.....	\$3,992,169.30
Unrestricted Bequests.....	225,093.91
	<hr/> 4,217,263.21

Against which has been charged

Loss on investments....	\$41,862.35	
Deficit in Operations to date	334,331.58	
Homewood Development in excess of Funds available	377,994.46	
	<hr/>	\$754,188.39
		<hr/> \$3,463,074.82

These liabilities deducted should be offset by cash on hand and good current assets. That such is not the case is due to the fact that the University has had to provide cash to meet the accumulated deficits of \$334,331.58 and an amount from General Account for Homewood Development, \$377,994.46, a total of \$712,326.04.

The University has a number of unrestricted legacies, which, together with the proceeds of the University property on Howard Street, when sold, could be applied to liquidate the above liabilities.

In addition to these present assets the University is interested as remainderman in a number of estates which will be available on the termination of existing life estates. These amount in all to about \$900,000. There are, apart from the liabilities just enumerated, no debts or obligations except that under the will of John W. McCoy the University must pay an annuity, etc., of \$950, which will terminate on the expiration of the life tenancy.

It is apparent that our most pressing need is greater resources available for general purposes. It is of course extremely gratifying that we can look forward to the next three years without apprehension. But it will not do for us to feel that our financial problem has been solved. We must have, in order permanently to conduct the work of the University

on its present scale, an endowment which gives us an increase in income available for general purposes, of about \$80,000. This means an increase in endowment of about two million dollars. Until this is secured we cannot afford to devote any of our present available funds to the erection of buildings not productive of revenue, no matter how desirable the construction of such buildings may appear to be. We must further continue to be as economical as in the past, and set our face against any expansion of our work until additional income is provided. Indeed, when possible, we should consider the contraction of our work where such contraction may be brought about without involving personal hardship or impairing the prestige of the University. It is only in this way that we shall be able, until our income is greatly increased, to meet those demands for salary increases which are already imperative.

PERSONAL MENTION

Dr. Harmon N. Morse, Professor of Inorganic and Analytical Chemistry and Director of the Chemical Laboratory, resigned his position in June and was made Professor Emeritus. Dr. Morse came to the University in 1876 as a Fellow in Chemistry and was almost immediately appointed an Associate. He was successively elected Associate Professor and Professor of Inorganic and Analytical Chemistry, and during the last eight years he served as Director of the Laboratory. Among the numerous honors won by Professor Morse the latest is the award, through the Turin Academy of Sciences, of the "Avogadro Medal," in recognition of his work during many years on the problem of measuring the osmotic pressure of solutions.

Death has removed from our ranks one of our most earnest and devoted teachers and investigators, Dr. Harry C. Jones, Professor of Physical Chemistry. Professor Jones had been connected with the University as student and teacher nearly thirty years. He received the bachelor's degree in 1889, subsequently holding a fellowship, and receiving the degree of

Doctor of Philosophy in 1892. He then spent two years in Germany. In 1895 he became Instructor in Chemistry, and was successively Associate, Associate Professor, and Professor of Physical Chemistry.

Professor Ames has been appointed a member of the National Advisory Committee for Aeronautics, being a member also of its Executive Committee. The Committee has devoted itself largely during the past year to getting the army equipped with suitable air planes and to carrying on scientific investigations dealing with problems of flight.

Professor Harry F. Reid was a member of the Committee of the National Academy of Sciences to consider and report upon the possibility of controlling the slides which are seriously interfering with the use of the Panama Canal. Together with this committee he visited the canal in December and spent about three weeks in field examinations.

Professor Willoughby has been absent on leave, having accepted appointment as legal adviser to the Chinese Government.

Dr. C. Carroll Marden, Professor of Spanish, has accepted a call to Princeton University. His duties in his new field of work will begin in October 1916, but he will continue to direct the courses in Spanish here during the next academic year, spending one day each week in Baltimore and conducting several graduate courses. The undergraduate work will be assumed by Dr. Erasmo Buceta, who comes from Madrid especially for work in this University.

The following promotions and appointments in the philosophical and engineering faculties have recently been made:

KNIGHT DUNLAP, Ph. D., formerly Associate Professor, Professor of Experimental Psychology.

JOSEPH C. W. FRAZER, Ph. D., formerly Associate Professor, Professor of Analytical Chemistry.

E. EMMET REID, Ph. D., formerly Associate Professor, Professor of Organic Chemistry.

CHARLES WINSLOW ELLIOTT, 1st Lieut., U. S. A., Professor of Military Science.

RALPH V. D. MAGOFFIN, Ph. D., formerly Associate, Associate Professor of Greek and Roman History.

GRANDVILLE R. JONES, C. E., formerly Associate, Associate Professor of Civil Engineering.

PAUL B. DAVIS, Ph. D., formerly Instructor, Associate in Chemistry.

WILLIAM B. KOUWENHOVEN, Dr.-Ing., formerly Instructor, Associate in Electrical Engineering.

HENRY SLONIMSKY, Ph. D., formerly Instructor, Associate in Philosophy.

WILLIAM F. ALBRIGHT, Ph. D., Instructor in Semitic Languages.

FLORENCE E. BAMBERGER, A. M., Instructor in Education.

JOHN H. BRINGHURST, B. C. E., Associate in Civil Engineering.

ERASMO BUCETA, Doctor en Derecho, Instructor in Spanish.

WILLIAM J. DANA, M. E., Instructor in Mechanical Engineering.

ARTHUR F. GORTON, Ph. D., Instructor in Physics.

GUSTAV GRUENBAUM, Ph. D., Instructor in Romance Languages.

WALTER S. HASTINGS, A. M., Instructor in Romance Languages.

CHILTON L. POWELL, Ph. D., Instructor in English.

A list of recent appointments in the medical faculty is given in the report of the Dean (see Appendix).

JOHNSTON SCHOLARSHIPS

The incumbents of the Johnston Scholarships were Eugene W. Burlingame (Ph. D., Pennsylvania, 1910), reappointed for a second year, in the department of Sanskrit and Comparative Philology; Clarence W. Hewlett (A. M., Johns Hopkins, 1911, Ph. D., 1912, and Assistant, 1914-15), in Physics; Karl S. Lashley (Ph. D., Johns Hopkins, 1914, Fellow and Bruce Fellow, 1913-15), in Experimental Psychology. Dr. Lashley has been reappointed for 1916-17, and the other appointees are Howard S. Fawcett, M. S., Associate Professor of Plant Physiology in the University of California, and Alexander Green, Ph. D., recently Instructor in German in the University of Illinois.

COMMEMORATION DAY

The fortieth anniversary of the opening of the University was observed on Tuesday, February 22, 1916, in McCoy Hall at 11 o'clock in the morning. Rev. John McDowell, D. D.,

Pastor of the Brown Memorial Presbyterian Church, Baltimore, offered the opening prayer. The chief address was delivered by Dr. V. K. Wellington Koo, the Chinese Minister at Washington, his subject being "The Building of a Nation as illustrated by the History of the United States and China." A portrait of Dr. Henry Wood, Professor of German in the University, was given by friends and former pupils of Professor Wood, the presentation speech being made by Thomas S. Baker, Ph. D., Director of the Tome School. The President of the University then recounted some of the needs of the University and the numerous benefactions recently received. The degree of Doctor of Medicine was conferred upon James Julian Chisolm, of Mississippi. The General Alumni Association held its annual meeting and dinner in the evening at the Hotel Emerson. A description of the public exercises, with the three addresses, and an account of the alumni gathering are given in the *University Circular*, February, 1916.

CONFERRING OF DEGREES

The bestowal of degrees took place in the Academy of Music, June 13, at 4 o'clock. Rev. John H. Strong, D. D., Pastor of the Eutaw Place Baptist Church, offered the opening prayer and pronounced the benediction at the close of the exercises. The President of the University made a brief congratulatory address to the graduates, and degrees were conferred as follows: Bachelor of Arts, twenty-seven; Bachelor of Science in Engineering, twelve; Bachelor of Science, three; Master of Arts, thirteen; Doctor of Philosophy, thirty-seven; Doctor of Medicine, eighty-one. The President also announced some important gifts and bequests to the University, and Dr. Welch made a statement regarding the establishment in this University by the Rockefeller Foundation of a School of Hygiene and Public Health. In the evening the President and Faculty received the graduates and their friends in McCoy Hall.

ACADEMIC CELEBRATIONS

The University has been officially represented at the following academic celebrations and scientific gatherings: The fiftieth anniversary of the foundation of Vassar College and the inauguration of President Henry M. McCracken, Professor Mathews being our representative; the inauguration of Dr. John H. McCracken as President of Lafayette College, delegate Professor Bright; the American Association for the Advancement of Science, in Columbus, Ohio, Professor Jennings representing us; the Pan-American Scientific Congress, in Washington, Professors Ames and Thomas, delegates; the inauguration of President Holland, of the State College of Washington, Professor A. E. Egge, one of our alumni in the faculty of the College, being our representative.

PUBLIC LECTURES AND ASSEMBLIES

The Percy Turnbull Memorial Lectures on Poetry were delivered by Mr. Paul Elmer More, of Princeton, N. J. The course, which was the twenty-first in the series, consisted of seven lectures on "Poets of America." (March 29, 31, April 3, 5, 7, 10, 12).

The ninth course of lectures on the Herter Foundation was delivered by Dr. Theobald Smith, of the Rockefeller Institute for Medical Research, who treated the subject of "Parasitism," in three lectures (May 11, 12, 15).

A series of lectures was given under the joint auspices of the University, the Women's Civic League, and the Municipal Art Society. The lecturers and their subjects were as follows: President Goodnow, "Municipal Problems" (November 4); Dr. Frederick C. Howe, Commissioner of Immigration, New York, "The Incoming Alien: A Problem and a Program" (November 11); Thomas Adams, Esq., Town-Planning Adviser to the Commission on Conservation, of Canada, "City Planning" (December 2); Dr. Thomas Mott Osborne, Warden of Sing Sing Prison, "The Care of Prison-

ers" (December 9); Dr. Talcott Williams, Dean of the Pulitzer School of Journalism, Columbia University, "Influence of the Press" (December 16). The concluding lecture was given in McCoy Hall, the others in the Academy of Music.

The one-hundredth anniversary of the organization of the American Bible Society was commemorated in McCoy Hall (May 9) with an address by Professor Haupt on the "Origin of our Bible."

Professor Moritz J. Bonn, Director of the College of Commerce in Munich, gave three lectures on "Germany's Economic Problem" (March 27, 28, 30).

Professor Joseph Dunn, of the Catholic University of America, delivered an address in McCoy Hall on "Ireland's Epopee, the Oldest Epic Tale of Western Europe" (February 28).

Professor G. H. Parker, of Harvard University, lectured on the "Seal Herd of the Pribiloff Islands: Its Biology and Management" (April 19).

Professor Harry F. Reid, of this University, gave an illustrated lecture on the "Panama Slides" before the University Scientific Association (May 5).

Professor Theodore C. Janeway, of our medical faculty, addressed the University Scientific Association on "Diseases of the Heart and Arteries" (April 6):

Professor A. G. Christie, of this University, gave an illustrated lecture on the "Rocky Mountains of Canada" (March 20.)

A lecture on the "Glacier National Park," with motion pictures and stereopticon views, was given by Mr. L. D. Kitchell (January 8).

Courses or single lectures were given before various departments, as follows:

Professor Charles D. Hazen, of Smith College, on the "Rise of Democracy in France," weekly lectures during the academic year.

Mr. Edward Porritt, of Hartford, Conn., ten lectures on

"American-Canadian Diplomacy," on the Albert Shaw Foundation.

Dr. James Brown Scott, Secretary of the Carnegie Endowment for International Peace, two lectures weekly through the year on "International Law and Diplomacy."

Before the department of Romance Languages: M. Elie Carcassonne, of Paris, on "French Literature," throughout the year; Professor Thomas F. Crane, of Cornell University, one lecture on "The *Exempla* as illustrating Mediæval Imagination"; Professor Christian Gauss, of Princeton University, one lecture on "A Newly-Discovered Edition of Rousseau's *Contrat Social*"; Professor Rafael Jaen of the United States Military Academy, one lecture on "Estudios Espagnoles en Madrid"; Professor J. Merlant, of the University of Montpellier, one lecture on "Balzac"; Professor Frederick M. Warren, of Yale University, one lecture on the "Present View of the Early History of the French National Epic."

Mr. Frederic H. Wagner, of Baltimore, several lectures on "Gas Engineering and By-Product Recovery," before the department of Engineering.

Dr. Willis T. Lee, of the United States Geological Survey, ten lectures before the department of Geology on the "Mesozoic Physiography of the Southern Rocky Mountains."

The University halls have been used by many local and national organizations for lectures or public meetings:

Municipal Art Society; Baltimore Society of the Archeological Institute of America; Educational Society of Baltimore; Public School Teachers' Association of Baltimore; History Teachers' Association; High School Teachers' Association; Teachers' College Club of Maryland; Classical Club; Baltimore Teachers' Training School; School Art League; Instructive Nurses' Association, together with other organizations for the furtherance of children's rights; Kindergarten Club; Women's Civic League; Maryland Federation of Women's Clubs; Women's College Club; Women's Christian Temperance Union; Consumers' League; Maryland

Peace Society; Maryland League for National Defense; Red Cross Society; Serbian Relief Committee; Federated Charities; St. Vincent de Paul Society; Skin and Cancer Hospital; St. Barbara's Home for Girls; American Society of Civil Engineers; American Society of Hygiene; National Surgical Dressing Committee; Audubon Society; an evening session of the Centenary Celebration of Gas Lighting in Baltimore.

The nineteenth annual Inter-class Debate between the senior and junior classes and the annual Contest in Public Speaking were held in McCoy Hall, January 28. The subject chosen for debate was the relative merits of a unicameral and a bicameral system for state legislatures. The seniors were successful and were awarded the Adams Prizes of books. Morton K. Rothschild was adjudged the best speaker in the public speaking contest and was awarded the Adams Medal.

The annual Intercollegiate Contest in Oratory, under the auspices of the Intercollegiate Peace Association, was held in McCoy Hall, March 24. The contestants represented St. John's College, Georgetown University, Loyola College, the Maryland Agricultural College, and Johns Hopkins University. The representative of Loyola College was adjudged the winner of the contest.

The Triangular Intercollegiate Debate between students of this University and of the Universities of North Carolina and Virginia was held in McCoy Hall, April 29, the subject of the debate being compulsory military or naval training for the men of this country. Two "teams" representing the Johns Hopkins met teams at Charlottesville and Chapel Hill, and teams from Charlottesville and Chapel Hill contested in McCoy Hall. The representatives of this University won both contests.

AWARD OF PRIZES

The Henrico Medallion, established by the Colonial Dames of America, Chapter I, was awarded to Percy Scott Flippen (Ph. D., 1912), in recognition of his study of the "Financial Administration of the Colony of Virginia."

The Severn Teackle Wallis Memorial Prize, established by the Wallis Memorial Association of Baltimore, was bestowed upon Aaron Schaffer (A. B., 1914), for his essay on "Don Mariano José de Larra, the Greatest of Spanish Journalists."

The Tocqueville Medal, the gift of Baron Pierre de Coubertin, of Paris, was given to Reuben Oppenheimer (of the second year undergraduate class), who had delivered the best speech in a contest in public speaking, his subject being "The (French) Revolution of 1848."

VISIT TO SOUTHERN UNIVERSITIES

During the month of April the President of the University visited several of the Southern universities. The following institutions were included in the itinerary: The University of South Carolina (Columbia); the University of Georgia (Athens); the University of Alabama (Tuscaloosa); Tulane University (New Orleans); the University of Mississippi (Oxford); Vanderbilt University (Nashville); and the University of Tennessee (Knoxville). In almost every case an address was given before a general assembly of the students of the institution visited. The cordial reception everywhere accorded and the opportunity afforded to meet the members of the various faculties, both our own alumni and those of other institutions, made it apparent that the visits of representatives of this University to the Southern institutions were regarded favorably by them.

Respectfully submitted,

FRANK J. GOODNOW,

President.

September 30, 1916.

REPORTS ON THE INSTRUCTION IN THE CHIEF BRANCHES OF STUDY, 1915-16

Prepared by the Principal Instructors in the Several Departments

MATHEMATICS

GRADUATE COURSES

Professor Morley gave the following courses:

1. Higher Geometry. *Three hours weekly, first half-year.*

Some developments in kinematics were treated at length, and the theory of rational curves was then discussed.

2. Theory of Functions. *Three hours weekly, second half-year.*

This course was an account of Riemann's methods and a comparison with the later theory of linear series.

Associate Professor Coble gave the following courses:

Algebraic Functions. *Two hours weekly through the year.*

This course followed standard expositions.

Associate Professor Cohen gave the following courses:

Elementary Theory of Functions. *Two hours weekly through the year.*

After a preliminary study of the theories of sequences and series, a study of functions of the complex variable, from both the Weierstrass and Cauchy points of view, was made.

Lie Theory of Continuous Groups. *Two hours weekly through the year.*

A detailed study of continuous groups of point and contact transformations was made and applied to the solution of ordinary and partial differential equations.

Dr. Bateman gave a course on the theory of relativity. *Two hours weekly through the year.*

This course included a study of the recent theories of time, space and gravitation. The electromagnetic equations for moving ponderable bodies were discussed and an account was given of Störmer's work on the motion of a charged particle in a steady magnetic field.

The Seminary and reading class met each week.

The American Journal of Mathematics is in its thirty-eighth volume.

The undergraduate courses were conducted by Professor Hulburt, Associate Professors Coble and Cohen, and Dr. W. F. Shenton.

Time and electromagnetism. *Messenger of Mathematics*, November, 1915.

A certain system of linear partial differential equations. *Bulletin of the American Mathematical Society*, April, 1916.

F. MORLEY.

An extension of Feuerbach's Theorem. *Proceedings of the National Academy of Sciences*, Vol. 2, No. 3, March, 1916.

A. B. COBLE.

An Isomorphism between Theta Characteristics and the $(2p + 2)$ —Point: *Annals of Mathematics*, Second Series, Vol. 17, No. 3, March, 1916.

Point Sets and Allied Cremona Groups (Part II) (résumé): *Proceedings of the National Academy of Sciences*, Vol. 2, No. 4, April, 1916.

PUBLICATIONS

H. BATEMAN.

Some recent researches on the motion of fluids. *Monthly Weather Review*, April, 1915.

The mean value of a function of spherical polar co-ordinates round a circle on a sphere. *Terrestrial Magnetism and Atmospheric Electricity*, September, 1915.

FRANK MORLEY,
Professor of Mathematics.

PHYSICS

The Physical Laboratory has been open daily during the year for the work of advanced and undergraduate students. Regular courses of lectures have been given, and meetings have been held weekly for the reading and discussion of the current journals. The Physical Seminary has met once a week and the list of papers presented is given below.

The regular courses of instruction were as follows:

By Professor Ames:

1. Physical Seminary. *One hour weekly, through the year.*
2. General Physics:
 - a. Thermodynamics and Heat Conduction.
 - b. Recent Physical Theories.*Four hours weekly, through the year.*
3. Undergraduate Physics I. *Three hours weekly, through the year.*
4. Journal Meeting. *One hour weekly, through the year.*

By Professor Wood:

Physical Optics. *Three hours weekly, through the year.*

By Professor Bliss:

1. Undergraduate Physics III: Electricity and Magnetism. *Three hours weekly, first half-year.*
2. Undergraduate Physics II: Mechanics. *Three hours weekly, second half-year.*

By Associate Professor Pfund:

1. Undergraduate Physics II: Wave-motion. *Three hours weekly, first half-year.*
2. Undergraduate Physics III: Optics. *Three hours weekly, second half-year.*

By Associate Professor Anderson:

1. General Astronomy. *Three hours weekly, through the year.*
2. Celestial Mechanics. *Two hours weekly, through the year.*

The work in undergraduate Physics I, II and III was carried out in part by several assistants: Mr. F. A. Ferguson, Mr. R. C. Dingle-dine, Mr. S. M. Burka, Mr. F. L. Mohler and Mr. A. D. Power.

The laboratory work for undergraduates has been under the direction of Professor Bliss and Dr. Pfund, with the assistance of Messrs. Ferguson, Dingle-dine, Burka, Mohler and Power. The work in the Astronomical Observatory was under the direction of Associate Professor Anderson with the assistance of Dr. MacKenzie. The advanced work and the original investigations have been under the direction of Professors Ames, Wood, Pfund and Anderson.

In the Physical Seminary papers on the following subjects were read as follows:

Dr. C. W. Hewlett—Theories of Permanent Magnetism; Criticisms of the Quantum Hypothesis.

Dr. E. O. Hulburt—The Constitution of the Sun.

Mr. R. W. Dickey—The Quantum Hypothesis; Theoretical Interpretation of Entropy.

Mr. S. M. Burka—Theoretical Interpretation of Ratio of Specific Heats of Gases; Recent Work with x-Rays.

Mr. R. C. Dingle-dine—The Joule-Thomson Experiment.

Mr. F. A. Ferguson—Determinations of Latent Heats; Measurements of Heat Conductivity.

Mr. F. L. Mohler—Theory of Concentrated Solutions; Properties of the Critical State.

Miss M. L. Morse—The Fundamental Experiments in Heat.

Mr. F. D. Murnaghan—Theories of Radiation; Nature of White Light and X-Rays.

Mr. A. D. Power—Determination of Ratio of Specific Heats of Gases; Laws of Radiation.

Mr. W. W. Steffey—Biography of Joule; Properties of Bodies at Low Temperatures.

Mr. V. Voss—Measurement of Light-Pressure; Theory of Specific Heats of Solids.

Mr. C. H. Walker—Laws of Gases; Avogadro's Hypothesis.

Miss L. Wilson—The Absolute Temperature of 0° Centigrade; The Theoretical Interpretation of Temperature.

Mr. M. K. Doren—The Cause of the Widening of Spectrum Lines.

In addition to these papers full reports were made of the dissertations submitted by Messrs. Dickey and Hoxton.

There were sixteen advanced students who followed Physics as their principal subject; of these two absolved the requirements for the degree of Doctor of Philosophy, and three those for the degree of Master of Arts. Their names and the titles of their dissertations, or essays in the latter cases, are as follows:

Mr. R. W. Dickey—The Application of the Plane Grating to the Determination of the Index of Refraction of a Gas with values for air from wave-length 2500 to wave-length 6500.

Mr. L. G. Hoxton—The Joule-Thomson Effect for Air, at Moderate Temperatures and Pressures.

Mr. S. M. Burka—Radioactive Elements.

Mr. F. L. Mohler—Properties of Matter at the Critical Point.

Mr. V. Voss—Theories of Specific Heats of Solids.

Dr. J. A. Anderson and Dr. D. MacKenzie have had charge during the year of the ruling of diffraction gratings. They have also continued with the construction of a new ruling engine for larger gratings with high dispersion.

It is with deep regret that I have to report that Dr. Anderson has accepted a position at Mt. Wilson Observatory, Pasadena, California, where he will have unique opportunities for those investigations in which he is especially interested.

The various instructors in the laboratory have been engaged actively in their different fields of investigation, but few of the results have been published. Professor Wood, with the coöperation of Professor Kimura of the University of Kyoto, has made great progress in the investigation of certain anomalous Zeeman effects. Professor Pfund has added greatly to our knowledge of the light sensitiveness of solids by his study of the phenomena in cuprous oxide. Various students are almost without exception engaged in researches which will be of permanent value.

In the fall of 1915 Professor Wood had leave of absence to continue at the Mt. Wilson Observatory, Pasadena, California, an investigation in which he had been interested for some time, that of photographing the moon and certain of the planets in monochromatic light. An account of this investigation has been published in the *Astrophysical Journal*, May, 1916.

This is the last year in which the department of Physics will have its work in the present Physical Laboratory. When the autumn term opens in October, its work will be continued in the Mechanical and Electrical Engineering Building at Homewood. It is a matter of regret that we cannot have our own laboratory building, but as long as the work is continued in the same spirit I trust that there will be no decrease either in quantity or in quality. The great need of a laboratory is a large increase in appropriations for apparatus and equipment. Until this is obtained the work of the laboratory will necessarily be limited to those fields for which we are prepared. Many new problems arise each year which are well worth investigating but which we cannot undertake.

JOSEPH S. AMES,
Director of the Physical Laboratory.

CHEMISTRY

The following courses of instruction were given:

I. *An elementary course of experimental lectures*, accompanied by classroom conferences and examinations and extending through the year.

II. *A laboratory course*, also extending through the year, which was taken simultaneously with Course I, and was designed to familiarize beginners with the experimental side of chemistry.

Courses I and II were under the direction of Professor Gilpin, who was aided by Dr. Miller and two laboratory assistants.

III. *Systematic Inorganic Chemistry*, a lecture course extending through the year, taken by undergraduates who had previously completed courses I and II, and by some graduates from other institutions.

IV. *A laboratory course*, extending through the year, in the reactions and preparations of inorganic compounds and in quantitative and qualitative analysis. This course was taken in conjunction with course III.

Courses III and IV were under the direction of Associate Professor Lovelace, who was aided by two laboratory assistants.

V. *Systematic Organic Chemistry*, a course of lectures given by Professor Gilpin, which extended through the year and was taken by the more advanced undergraduates and by the less advanced graduates from other institutions.

VI. *A laboratory course*, under the direction of Professor Gilpin, in the reactions and preparations of organic compounds.

VII. *Advanced Inorganic Chemistry*, a course of lectures by Associate Professor Lovelace, which extended through the year.

VIII. *Advanced Organic Chemistry*, a course of lectures, extending through the year, by Associate Professor Reid.

IX. *A laboratory course*, extending through the year, in the reactions and preparation of organic compounds, by Associate Professor Reid.

X. *Quantitative Chemistry*, a laboratory course extending through the year, by Professor Morse and Associate Professor Frazer.

XI. *Physical Chemistry*, a course of lectures extending through the year, by Professor Jones and Dr. Lloyd.

XII. *Physical Chemical Methods*, a laboratory course conducted by Professor Jones.

XIII. *Advanced Graduate Chemistry*.

This is a composite course of lectures, of two or three years' duration, given by the members of the teaching staff, in which selected important topics in chemistry are discussed with greater thoroughness than is practicable in the more general courses.

The following courses under schedule XIII were given during the past academic year:

By Professor Remsen: The History of Chemistry.

By Professor Jones: Modern Developments in Chemistry.

XIV. *Lectures by Advanced Students.* To each of the more mature students, there is assigned for historical investigation some important topic in chemistry. The results of his investigations are incorporated in a lecture which he gives before the teaching staff and the students. Twenty-one such lectures have been given during the past academic year.

RESEARCH

During the past year a great variety of problems has been under investigation by the teaching staff and the advanced students who were associated with them.

Professor Morse, working under grants from the Carnegie Institution of Washington, has had associated with him Associate Professor Frazer, Associate Holland, Messrs. Blocher and Minter. The problems which were investigated are:

1. The Osmotic Pressure of Cane Sugar at high Temperatures. (Dr. Holland.)
2. The Osmotic Pressure Measurements of Levulose Solutions at 30°. (Mr. Blocher.)
3. The Osmotic Pressure of Levulose Solutions. (Mr. Minter.)
4. The Construction of Osmotic Pressure Cells for high Osmotic Pressures. (Associate Professor Frazer and Mr. Myrick.)
5. The Osmotic Pressure of Sucrose Solutions at 30°. (Associate Professor Frazer and Mr. Myrick.)
6. The Osmotic Pressure of Concentrated Solutions of Dextrose at 30°. (Mr. Minter and Associate Professor Frazer.)

Associate Professor Frazer and Mr. Whiteford: The use of Barium Salts for the decomposition of Silicates for Analysis.

Associate Professor Frazer, Dr. Holland, and Dr. Miller: A method of decomposing mineral Silicates for the recovery of their Potash and Alumina in the form of any desired salt.

Professor H. C. Jones had associated with him in research Dr. P. B. Davis, Dr. E. O. Hulburt, and Dr. H. H. Lloyd working under a grant from the Carnegie Institution of Washington, and Messrs. Connolly, Hutchinson, Johnson, Ordeman, and Pardee. The problems that have been investigated are:

1. The viscosity of caesium salts in glycerol-water mixtures. (Dr. Davis.)
2. A further study of formamid as a solvent and ionizing medium. (Dr. Davis and Mr. Johnson.)
3. A study of the light absorption coefficient of solutions. (Dr. Hulburt and Mr. Hutchinson.)
4. The conductivities of organic salts in absolute ethyl alcohol. (Dr. Lloyd and Mr. Pardee.)

5. The different dissociating power of free and combined water. (Mr. Ordeman.)
6. The different chemical behavior of free and combined water. (Mr. Connolly.)

Associate Professors Frazer and Lovelace have had associated with them in their investigations on the vapor pressure of solutions Messrs. Sease and Rogers. The problem under investigation consisted in measuring the vapor pressures of aqueous solutions of mannite.

Associate Professor Reid has had associated with him in research work Dr. Lyman, and Messrs. Kimball, Markel, Sachs, Van Epps, Wroth, Lyons, Lotz, Faber, Freas and Treide. The problems which they have studied are:

1. The esterification of acids by isomeric mercaptans. (Mr. Kimball.)
2. The esterification of isomeric acids by mercaptans. (Mr. Sachs.)
3. Ester transformations. (Mr. Markel.)
4. The formation of nitriles. (Mr. Van Epps.)
5. Relative solubilities. (Mr. Wroth.)
6. The identification of acids. (Dr. Lyman and Mr. Lyons.)
7. Esterification limits. (Mr. Freas.)
8. The esterification of aliphatic acids by mercaptans. (Mr. Faber.)
9. Aniline black. (Mr. Treide.)

PUBLICATIONS

The publications here mentioned relate largely, of course, to work which was completed during the academic year 1914-15; much of the work of 1915-1916 will be published during the year 1916-1917.

Harry C. Jones, with P. B. Davis, E. J. Shaeffer, W. S. Putnam, M. G. Paulus, H. H. Lloyd, J. E. L. Holmes, C. Watkins, J. B. Wiesel, G. F. Ordeman, G. C. Connolly, J. F. Hutchinson, and A. G. McCall.

Conductivities and Viscosities in Pure and in Mixed Solvents: Radiometric Measurements of the Ionization Constants of Indicators. Carnegie Institution of Washington. *Publication No. 230* (1915).

Harry C. Jones, with P. B. Davis and W. S. Putnam.

The Conductivity and Viscosity of Solutions of Electrolytes in Formamid. *Journ. Franklin Institute*, 567, Nov., 1915; *Chem. News*, 112, 284.

Harry C. Jones, with P. B. Davis.

The Viscosities of Solutions of Caesium Salts in Mixed Solvents. *Journ. Amer. Chem. Soc.*, 37, 2636. (1915).

Harry C. Jones, with Chas. Watkins.

Conductivity and Dissociation of Some Rather Unusual Salts in Aqueous Solutions. *Journ. Amer. Chem. Soc.*, 37, 2626. (1915).

- Harry C. Jones, with H. H. Lloyd and J. B. Wiesel.
Conductivities of Certain Organic Acids in Absolute Ethyl Alcohol.
Journ. Amer. Chem. Soc., 38, 121. (1916).
- Harry C. Jones, with J. E. L. Holmes.
The Action of Salts with Water of Hydration and without Water of Hydration on the Velocity of Saponification of Esters.
Chem. News, 112, 73 (1915); *Journ. Amer. Chem. Soc.*, 38, 105 (1916).
- Harry C. Jones, with M. G. Paulus and J. F. Hutchinson.
Radiometric Measurements of the Ionization Constants of Indicators.
Chem. News, 112, 195. (1915).
- J. C. W. Frazer, with R. T. Myrick.
The Osmotic Pressure of Sucrose Solutions at 30°. *Trans. Amer. Chem. Soc.*, 38, 1907. (1916).
- E. Emmet Reid.
The Identification of Acids. *Journ. Amer. Chem. Soc.*, 39, 124. (1917).
- E. Emmet Reid, with G. D. Van Epps.
Studies in the Preparation of Nitriles. II. The Preparation of Aliphatic Nitriles. III. The Catalytic Preparation of Nitriles.
Journ. Amer. Chem. Soc., 38, 2120 and 2128 (1916).
- E. Emmet Reid, with B. B. Wroth.
The Solubilities of Liquids in Liquids. The Partition of the Lower Alcohols between Water and Cottonseed Oil. *Journ. Amer. Chem. Soc.*, 38, 2316 (1916).
- E. Emmet Reid, with J. H. Sachs.
Studies in Esterification. VII. The Esterification of o-, m-, and p-Toluic Acids by Ethyl Mercaptan. *Jour. Amer. Chem. Soc.*, 38, 2746 (1916).
- E. Emmet Reid, with J. W. Kimball.
Studies in Esterification. VIII. The Esterification of Benzoic Acid by Isomeric Butyl Mercaptans. *Jour. Amer. Chem. Soc.*, 38, 2757 (1916).
- B. F. Lovelace.
Editor: Chemical Directory of the United States.

STUDENTS

The number of students working in the chemical laboratory was 149. Of these 39 were graduates, of whom 32 were following chemistry as their principal subject.

Eleven students were promoted to the degree of Doctor of Philosophy. Their names and titles of their dissertations are given below:

J. M. Blocher: Osmotic Pressure Measurements of Levulose Solutions at 30°.

G. C. Connolly: The Difference in Chemical Activity of Free and Semi-Combined Water as illustrated by the Effect of Neutral Salts on the Hydrolysis of Acetic Anhydride.

J. F. Hutchinson: The Absorption Coefficient of Solutions of Cobalt Chloride in Water and Various Alcohols for Monochromatic Radiation.

J. W. Kimball: The Esterification of Benzoic Acid by Isomeric Butyl Mercaptans.

P. D. Markel: The Transposition of Esters and the Interdependence of Limits.

R. T. Myrick: The Osmotic Pressure of Sucrose Solutions at 30°.

G. F. Ordeman: A Study of the Dissociating Powers of Free and Combined Water.

A. M. Pardee: A Study of the Conductivity of Certain Organic Salts in Absolute Ethyl Alcohol at 15°, 25°, and 35°.

J. H. Sachs: The Esterification of ortho, meta, and para Toluic Acids with Ethyl Mercaptan.

G. D. Van Epps: The Preparation of Aliphatic Nitriles and the Catalytic Preparation of Nitriles.

B. B. Wroth: A Study of the Solubilities of Liquids in Liquids. The Partition of the lower Alcohols between Water and Cottonseed Oil.

Mr. V. B. Sease was appointed University Fellow for the year 1916-17.

Dr. C. S. Hudson, of the United States Department of Agriculture, Dr. Hugh S. Taylor, of Princeton University, and Dr. John Johnston, of the Geographical Laboratory, gave brief courses of lectures before the department.

The Chemical Department has suffered a great loss in the death, on April 9, 1916, of Dr. H. C. Jones, Professor of Physical Chemistry.

E. EMMET REID,
Sec. Chemical Staff.

GEOLOGY

The Geological Laboratory was open daily throughout the year for graduate and undergraduate students. Lectures, field studies, and laboratory work were conducted as follows:

LECTURES

Undergraduate Courses

(a) Geology I: Physiography, Dynamical and Historical Geology, by Professor Swartz. *Three lectures and one afternoon of practical work each week throughout the year.*

(b) Geology II: Mineralogy and Elementary Petrography, by Professor Swartz. *Three lectures and two afternoons of practical work each week throughout the year.*

(c) Geology III: Applied Geology, by Professor Mathews. *Three lectures each week throughout the year.*

Graduate Courses

(d) Principles of Geology, by Professor Clark. *One lecture each week throughout the year.*

(e) Advanced Historical Geology, by Professor Clark. *One lecture each week throughout the year.*

(f) Geological Physics, by Professor Reid. *Two lectures each week throughout the year.*

(g) Exploratory and Geological Surveying, by Professor Reid. *Two lectures each week throughout the year.*

(h) Petrography, by Professor Mathews. *Three lectures and two afternoons of laboratory work each week throughout the year.*

(i) Paleontology, by Associate Professor Berry, assisted by Dr. Gardner. *Two lectures and two afternoons of laboratory work each week throughout the year.*

(j) Advanced Paleontology, by Associate Professor Berry. *One afternoon each week throughout the year.*

(k) Ore Deposits of the United States, by Dr. Singewald. *Two lectures each week throughout the year.*

(l) Ore Deposits of South America, by Dr. Singewald. *Two lectures each week throughout the second half-year.*

(m) Meteorology, by Dr. Fassig. *One lecture each week for one-half year.*

(n) Mesozoic Geology of the Rocky Mountains, by Dr. W. T. Lee of the U. S. Geological Survey. *Ten lectures in January and February.*

(o) Hawaiian Volcanoes, by Dr. T. A. Jagger, Jr., of the Massachusetts Institute of Technology. *One lecture in January.*

(p) South Pacific Geology, by Dr. J. P. Iddings of Washington. *One lecture in March.*

(q) Geological Conferences, by Professor Clark. *Weekly, throughout the year.*

FIELD STUDIES

(r) Field trip to study the Paleozoic formations of Western Maryland, by Professor Swartz. *One week in April.*

(s) Field trip to the Coastal Plain of Southern Maryland, by Associate Professor Berry. *Several days in November.*

(t) Field trip to study the ore deposits and mines of eastern Pennsylvania and northern New Jersey, by Dr. Singewald. *One week in April.*

(u) Field trip to study the structure and stratigraphy of the crystalline rocks about Glyndon, Maryland, by Professor Mathews. *One week in May.*

(v) Summer work on the Maryland Geological Survey. Many of the graduate students were given an opportunity to carry on field work in connection with the various investigations which are being conducted by the Survey. These positions afford unusual opportunities for training in field methods. Payment for services and field expense is provided.

LABORATORY WORK

(w) The geological laboratory was open *daily during the year* for the work of advanced students under the direction of Professor Clark, assisted by the other members of the staff.

ACTIVITIES

Professor Clark was engaged during the year in the study of various phases of Atlantic Coastal Plain geology with the coöperation of several assistants. He completed with the aid of others a monograph in two volumes on the Upper Cretaceous Deposits of Maryland for the Maryland Geological Survey, as well as portions of a final report on the Geology and Paleontology of the Cretaceous Formations of North Carolina for the North Carolina Geological Survey which had been prepared under his direction. In the case of the latter report he contributed the chapters on the General Geologic Relations and the Correlation of the Cretaceous Formations, together with a discussion of certain fossil forms contained therein. The results of the latter investigation are now ready for the press. He was also actively engaged during the year in the management of the Maryland Geological Survey and the Maryland Weather Service, and as a member of the State Board of Forestry of which he is Executive Officer. Professor Clark was appointed by the Chamber of Commerce of the United States a member of a committee of five, to discuss with representatives of organized labor a modification of the anti-trust laws by which co-operative agreements under the regulation of the Federal Trade Commission might be allowed in those industries dealing with the primary natural resources, since the present competitive practices result in the waste of such resources as well as in the injury and loss of life of the workers. The preliminary meetings of this conference were held in Washington during May and will be continued from time to time until an agreement is reached regarding the form of legislation which will be satisfactory to both capital and labor. Professor Clark was reelected President of the Association of American State Geologists and Treasurer of the Geological Society of America, and at the annual meeting of the National Academy of Sciences in April he was elected Chairman of the Section on Geology for a term of three years. In May he was made a Fellow of the American Academy of Arts and Sciences.

Professor Reid continued his seismological studies. He is the official American representative of the International Seismological Association and is also in charge of the earthquake records of the United States Geological Survey. Professor Reid was a member of the Committee of the National Academy of Sciences, appointed at the request of President Wilson "to consider and report upon the possibility of controlling the slides which are seriously inter-

fering with the use of the Panama Canal." The committee visited the Canal in December and spent about three weeks in field examinations. A Preliminary Report was handed to the President on February 4, and was published in the April number of the *Proceedings of the National Academy of Sciences*. A complete report will be made later. Since his return from Panama Professor Reid has been largely occupied with problems presented by the slides.

Professor Mathews, in coöperation with Dr. Bliss, of the U. S. Geological Survey, continued his field investigations in the Quarryville and McCall's Ferry (Pennsylvania) quadrangles. In coöperation with Dr. B. L. Miller of Lehigh University he has prepared a report on the Tolchester quadrangle which is now in press. As Assistant State Geologist Dr. Mathews has compiled and edited for the Maryland Geological Survey a large map of Baltimore, covering 80 square miles, on the scale of 1,000 feet to the inch; a similar map of Cumberland, covering 20 square miles, and several smaller maps in connection with the work of the Survey.

Professor Swartz was engaged in the study of the Silurian and Carboniferous formations of Maryland during the past year. The work upon the Silurian has been completed and the results will be ready for publication during the coming summer. It embraces a critical discussion of the faunas and stratigraphy of the Silurian system of Maryland and adds materially to our knowledge of that subject. A preliminary report of the work upon the Silurian was made to the Geological Society of America at its December meeting. Work upon the Carboniferous system is still in progress. The results thus far secured will have an important bearing upon the interpretation of the coal-bearing strata of Maryland.

Professor Berry continued his studies of the Mesozoic and Cenozoic floras of the southeastern United States for the U. S. Geological Survey. He has also made a study of the fossil plants of the Canal Zone for the Smithsonian Institution and of the West Indian petrified woods, which will form a part of a series on the geology and paleontology of that region to be published by the Carnegie Institution. During the year he edited the two-volume work on the Upper Cretaceous of Maryland published by the State Geological Survey, and prepared the articles on Paleobotany for the *New International Encyclopedia*.

Dr. Singewald returned in November from a seven months' trip to the mining districts of South America, in the course of which the following countries were visited: Brazil, Uruguay, Argentine, Chile, Bolivia, Peru, Ecuador, Panama, Costa Rica, Cuba, and other West Indian islands. Besides the observations made in the course of the trip, much material was secured that has been added to the economic collections of the Department. Since his return he has been engaged in further study of the material collected and the results are appearing in the form of papers contributed to the journals devoted to economic geology.

Dr. Gardner has been engaged in completing her work on the Miocene and Pliocene invertebrate faunas of North Carolina and Virginia. The major part of the year has been employed in faunal studies of the Upper Oligocene faunas of Florida for the U. S. Geological Survey.

Dr. Harvey Bassler, a graduate of some years' standing, was appointed Fellow by Courtesy. During the year he continued his monographic studies of the flora of the Coal Measures.

Mr. J. D. Sears was appointed University Fellow and Mr. W. P. Woodring Fellow by Courtesy.

There were fifteen advanced graduate students in the department with geology as their principal subject. Messrs. Reeves and Woodring absolved the requirements for the degree of Doctor of Philosophy, presenting dissertations on the following subjects:

Mr. Frank Reeves—A Discussion of the Absence of Water in Certain Petroleum-bearing Strata in the Appalachian Oil Fields.

Mr. W. P. Woodring—The Mollusca of the Bowden Beds of Jamaica.

During the field season of 1915 seven of the graduate students were employed in geological surveying under the auspices of the state surveys of Maryland, New York, Illinois, and Tennessee. Six were similarly employed by the United States Geological Survey in Maryland, Wyoming, Montana, and New Mexico. Two were employed in economic geological work in West Virginia. During the coming season five graduate and two incoming graduate students will be engaged in work for the Maryland Geological Survey, one for the Tennessee Geological Survey, five for the U. S. Geological Survey, one for the Bureau of Soils, one in economic work in West Virginia, and two in economic work in Oklahoma.

APPARATUS AND COLLECTIONS

Several valuable additions have been made to the apparatus and collections during the year. A large number of rare books have been purchased and the department now has one of the most complete geological libraries in this country. The library has been considerably enlarged by gifts of books and maps. Professor Cleveland Abbe, in particular, has added many books to the meteorological library which bears his name.

PUBLICATIONS

Clark, Wm. Bullock.

The Brandywine Formation of the Middle Atlantic Coastal Plain. *Amer. Jour. Sci.*, vol. xl, pp. 499-506, November, 1915.

The Age of the Middle Atlantic Coast Upper Cretaceous Deposits (with E. W. Berry and J. A. Gardner). *Proc. Nat. Acad. Sci.*, vol. ii, pp. 181-186, 1916.

The Upper Cretaceous Deposits of Maryland. *Md. Geol. Survey, Upper Cretaceous*, pp. 23-110, pl. i-vii, 1916.

Correlation of the Upper Cretaceous Deposits of Maryland (with E. W. Berry and J. A. Gardner). *Md. Geol. Survey, Upper Cretaceous*, pp. 315-342, 1916.

Echinodermata: In Systematic Paleontology of the Upper Cretaceous Deposits of Maryland. *Md. Geol. Survey, Upper Cretaceous*, pp. 749-752, pl. 47, 1916.

Reid, Harry Fielding.

Constitution of the Earth as Indicated by Seismological Investigations. *Proc. Amer. Philos. Soc.*, vol. liv, pp. 290-297, 1916.

- Variations of Glaciers XIX. *Jour. Geol.* vol. xxiii, pp. 548-555, 1915.
- Earthquakes and Volcanoes in "The American Year Book." Appleton, New York, 1916.
- Berry, Edward W.
- The Origin and Distribution of the Myrtaceae. *Botanical Gazette*, vol. lix, pp. 484-490, 1915.
- Paleobotanic Evidence of the Age of the Morrison (Read at Symposium of Paleontological Society in Philadelphia, Dec., 1914). *Bull. Geol. Soc. Amer.*, vol. xxvi, pp. 335-342, 1915.
- Pleistocene plants from Indian Head, Maryland. *Torrey*, vol. xv, pp. 205-208, 1 fig., 1915.
- The Pliocene Flora of Holland. *Science n. s.*, vol. xlii, p. 613-615, 1915.
- Erosion Intervals in the Eocene of the Mississippi Embayment. Professional Paper, No. 95 F, *U. S. Geological Survey*, 1915.
- Paleobotany. *New International Encyclopedia*, 1915.
- A Petrified Palm from the New Jersey Cretaceous. *Amer. Jour. Sci.*, vol. xli, pp. 193-197, figs. 1-4, 1916.
- The Geologic History of Gymnosperms (Read at Symposium of Botanical Society of America, San Francisco, August, 1915). *Plant World*, vol. xix, pp. 27-41, 2 figs., 1916.
- Charles René Zeiller (Account of his life and work). *Science n. s.*, vol. xliii, pp. 201-202, 1916.
- Notes on the Ancestry of the Beech. *Plant World*, vol. xix, pp. 68-77, 2 maps, 1916.
- Upper Cretaceous Floras of the World (abstract). *Proc. Nat. Acad. Sci.*, vol. ii, pp. 186-187, 1916.
- Remarkable Fossil Fungi. *Mycologia*, vol. viii, pp. 73-78, pl. 180-182, 1916.
- Upper Cretaceous Floras of the World. *Md. Geol. Survey, Upper Cretaceous*, pp. 183-314, 1916.
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- Vertebrata of Maryland Upper Cretaceous. *Md. Geol. Survey, Upper Cretaceous*, pp. 347-361, 1916.
- Floras of the Maryland Upper Cretaceous. *Md. Geol. Survey, Upper Cretaceous*, pp. 757-906, pls. 50-90, 1916.
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- The Physical Conditions indicated by the Flora of the Calvert Formation. *U. S. Geol. Survey, Professional Paper* 98 F, 1916.
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- The Genesis of the Chilean Nitrate Deposits (with Benj. L. Miller). *Economic Geology*, vol. ii, pp. 103-114, 1916.
- The Genesis and Relations of the Daiquiri and Firmeza Iron Ore Deposits, Cuba. *Bull. Amer. Inst. Min. Eng.*, March, pp. 671-678, 1916.

- High Grade Manganese Ores of Brazil. *The Iron Age*, vol. xcvii, pp. 417-420, 1916.
- Mining in Oriente Province, Cuba. *The Eng. and Min. Journal*, vol. c, pp. 587-592, 1916.
- The Mining Industry of Peru. *The Eng. and Min. Journal*, vol. ci, pp. 845-850, 1916.
- A Unique Salt Industry of Peru. *Bull. Pan-Amer. Union*, pp. 52-60, Jan., 1916.
- Mining Industry of Brazil (with Benj. L. Miller). *The Eng. and Min. Journal*, vol. ci, pp. 759-762, 1916.
- The World's Deepest Mine. *Bull. Pan-Amer Union*, pp. 805-819, Dec., 1915.
- Discussion of paper by C. F. Tolman, Jr.: Observations on Certain Types of Chalcocite and their characteristic etch patterns. *Bull. Amer. Inst. Min. Eng.*, p. 897, May, 1916.
- Gardner, J. A.
- The Age of the Middle Atlantic Coast Upper Cretaceous Deposits (with W. B. Clark and E. W. Berry). *Proc. Nat. Acad. Sci.*, vol. ii, pp. 181-186, 1916.
- Correlation of the Upper Cretaceous Formations (with W. B. Clark and E. W. Berry). *Md. Geol. Survey, Upper Cretaceous*, pp. 315-342, 1916.
- Mollusca, Brachiopoda, and Vermes: In *Systematic Paleontology of the Upper Cretaceous of Maryland. Md. Geol. Survey, Upper Cretaceous*, pp. 371-734, pls. 12-45.
- WILLIAM BULLOCK CLARK,
Director of the Geological Laboratory.

ZOOLOGY, BOTANY, PLANT PHYSIOLOGY

I. ZOOLOGY

The graduate work in zoology consists mainly in research, in which the students take part, under the guidance of the members of the staff, in the investigation of some fundamental problem. The following lines of research have been in progress during the past year:

(1) Under the direction of Professor Jennings, investigations in heredity, variation and evolution, particularly in the simplest organisms, and by the simplest method of reproduction, where there is but a single parent. Professor Jennings's work along this line on a close relative of *Amoeba* has been brought to a conclusion and the manuscript of an extensive paper on the subject is now in the hands of the publishers. The results demonstrate that racial differentiation is occurring slowly and gradually in such organisms as generations pass, and this quite independently of biparental reproduction.

Dr. A. R. Middleton continued his investigations of the effects of selection in one of the infusoria, and extended the work to a study

of the "inheritance of acquired" characters in these organisms. The effects of diversity of temperature for many generations were found to be inherited for many later generations, after restoration to the original temperature.

F. M. Root, Bruce Fellow, continued his investigations of variation, inheritance, and the results of selection in the rhizopod *Centropyxis*.

E. P. Churchill investigated the effects of conjugation on inheritance and variation in one of the simplest organisms.

Professor Jennings further carried on a theoretical investigation as to the mathematical results of Mendelian inheritance by various systems of breeding. A paper giving formulas for the results with respect to a single pair of characters has been published; and a similar one has been prepared on the results when more than one pair of characters, linked or not linked, are dealt with.

(2) Professor Andrews continued work on the life histories of animals and on their relations to the environment. A study from this point of view of the color changes in the large southern beetle, *Dynastes Tityrus*, has been published. The anatomy of *Folliculina* and some of its life history have been worked out more in detail.

(3) Under the direction of Associate Professor Mast, investigations have been carried on in the physiology and behavior of lower animals. Professor Mast himself has investigated mainly the reactions of organisms to lights of different colors, and his extensive memoir on such reactions in fishes, mentioned in last year's report, has in the meantime appeared in the Bulletin of the United States Bureau of Fisheries. A study of the reactions of fifteen different species of unicellular and other simple organisms, including worms and fly larvae, has been completed and is now ready for publication. In all of these species it was found that stimulation depends specifically upon the wave-length, but there is no evidence indicating that the relation between wave-length and stimulation is in any of them similar to that observed in man in color-vision.

Professor Mast and Mr. F. M. Root investigated the process of feeding in *Amoeba* with reference to certain physical theories of life processes in lower organisms. In this investigation the force exerted by these creatures was for the first time measured, and it was found to be of such a magnitude that it cannot be accounted for on the bases of changes in surface-tension. This conclusion militates against a widely-accepted theory of activity in *Amoeba*.

Professor Mast and Dr. K. S. Lashley studied the behavior of certain infusoria.

Mr. W. H. Taliaferro has concluded an investigation of certain phases in the process of feeding in *Amoeba* and worked on the function of the eyes in some of the flat worms. He has also prepared for the *Journal of Animal Behavior* the annual review of papers on the behavior of the lower invertebrates. Miss Bessie L. Moses has made some interesting observations on *Amoeba* feeding on stentor and on the process of digestion following. Miss Mary Gover has investigated the relation between luminous intensity and activity in some of the flagellate infusoria.

(4) Under the guidance of Associate Professor Grave, investigations on the nutritive processes in lower animals. Mr. E. P.

Churchill continued and concluded his work on nutrition in the fresh water mussel, demonstrating that in this animal fats and proteins and probably starch, were absorbed by the cells of the general body surface.

BIOLOGICAL JOURNAL CLUB

The instructors and graduate students in Zoology joined with those in Botany and Plant Physiology in a weekly club for the presentation and discussion of reviews of recent literature in these fields.

ZOOLOGICAL SEMINARY

The Seminary is a club for the discussion of the general and philosophical aspects of biology. It included the instructors and graduate students in Zoology, together with a number of persons from other departments or from outside the University. The Seminary met weekly throughout the year, and studied the History of Biology.

Lectures and classroom work have been conducted as follows:

Professor Jennings:

The Development of the Individual. *Three lectures weekly, from October 1 to February 1; once a week for the remainder of the year.*

Investigations in Experimental Zoology. *Daily, throughout the year.*

Professor Andrews:

1. General Biology. *Nine hours weekly, October 1 to March 15.*

2. Embryology. *Nine hours weekly, from March 15 to the end of the year.*

3. Zoology of Non-vertebrates. *Nine hours weekly, October to June.*

Associate Professor Grave:

Comparative Anatomy of Vertebrates, Cytology and Embryology. *Nine hours weekly throughout the year.*

Cytology of Development and Heredity. *One lecture and two laboratory periods weekly, second half-year.*

Investigations. *Hours as required.*

Associate Professor Mast:

General Physiology of Animals. *Three lectures or conferences and two laboratory periods weekly, throughout the year.*

Investigations in Animal Behavior. *Hours as required.*

Professor A. A. Schaeffer (Ph. D., Johns Hopkins University), of the University of Tennessee, conducted the courses in Biology in the summer session of 1915.

Mary Gover, H. S. Hopkins and W. H. Taliaferro were student assistants in Zoology for the year.

Professor Graves continues his work during the summer in charge of the course in Invertebrate Zoology at the Marine Biological Station at Woods Hole, Mass.

The requirements for the doctor's degree were absolved during the year by E. P. Churchill.

Francis M. Root has been reappointed Adam T. Bruce Fellow.

The transfer of the laboratory to Homewood has required much time and energy in the last months of the year. The Zoological Department is greatly indebted to Professor Andrews for his most efficient handling of this troublesome operation.

PUBLICATIONS IN ZOOLOGY

The following list includes the publications that have actually appeared between July 1, 1915, and July 1, 1916, but with the omission of those already mentioned in last year's report as "In press."

Andrews, E. A.

Color Changes in the Rhinoceros Beetle, *Dynastes Tityrus*. *Journal of Experimental Zoology*, Vol. 20 (1916), pp. 435-456.

Dolley, Wm. L., Jr.

Reactions to Light in *Vanessa antiopa* with Special Reference to Circus Movements. *Journal of Experimental Zoology*, Vol. 20 (1916), pp. 357-420.

Jennings, H. S.

The Numerical Results of Diverse Systems of Breeding. *Genetics*, Vol. 1 (1916), pp. 53-89.

The Numerical Results of Diverse Systems of Breeding. *Proceedings of the National Academy of Sciences*, Vol. 2 (1916), pp. 45-50.

The Work of the Zoological Department. *The Johns Hopkins Alumni Magazine*, June, 1916.

Lashley, K. S.

Results of Continued Selection in *Hydra*. *Journal of Experimental Zoology*, Vol. 20 (1916), pp. 19-26.

Mast, S. O.

The Process of Orientation in the Colonial Organism *Gonium pectorale*, and a Study of the Structure and Function of the Eyespot. *Journal of Experimental Zoology*, Vol. 20 (1916), pp. 1-17.

The Relative Stimulating Efficiency of Spectral Colors for the Lower Organisms (Preliminary Report). *Proceedings of the National Academy of Sciences*, Vol. 1 (1915), pp. 622-625.

The Relation between Wave-length and Stimulation in the Lower Organisms (Abstract). *Science*, Vol. 43 (1916), pp. 143-144.

Mast, S. O., and Root, F. M.

Observations on *Amoeba* Feeding on Infusoria and their Bearing on the Surface-tension Theory. *Proceedings of the National Academy of Sciences*, Vol. 2 (1916), pp. 188-189.

Middleton, A. R.

Heritable Variations and the Results of Selection in the Fission Rate of *Stytonychia pustulata*. *Proceedings of the National Academy of Sciences*, Vol. 1 (1915), pp. 616-621.

Stocking, Ruth J.

Variation and Inheritance in Abnormalities Occurring after Conjugation in *Paramecium candatum*. *Proceedings of the National Academy of Sciences*, Vol. 1 (1915), pp. 608-611.

Willis, H. S.

The Influence of the Nucleus on the Behavior of Amoeba. *Biological Bulletin*, Vol. 30 (1916), pp. 253-270.

II. BOTANY

Lectures and laboratory work have been conducted as follows:

By Professor Johnson.

Reproduction and Phylogeny in Plants. Lectures and laboratory work. *Nine hours a week, October to June. Six field trips on Saturdays.*

The Structure of Root, Stem and Leaf. *Laboratory work and conferences. Six hours a week, from October 1 to February 1. Field trips on Saturdays.*

Botanical Seminary. (The Oecology and Geographical Distribution of Plants.) *One hour a week, November to June.*

Laboratory Instruction and Research. *Daily, October to June.*

JOURNAL CLUB.

The botanists meet in conjunction with the zoologists and plant physiologists for the discussion of current literature.

ADVANCED WORK

Professor Johnson during July, August and September, 1915, continued his study of the development and proliferation of the fruits of the Cacti of Arizona, in the Coastal Laboratory of the Department of Botanical Research of the Carnegie Institution of Washington at Carmel, California. The results of these studies are being prepared for publication. Preliminary accounts of two phases of the work were presented at the San Francisco meeting of the American Association for the Advancement of Science, August, 1915.

W. E. Seifriz, Student Assistant in Botany, served as assistant in charge of equipment at the Harpswell Laboratory, from June to September, 1916.

BOTANICAL GARDEN

Seeds and plants needed for the Garden and in the Laboratories have been received from the garden of Lady Hanbury at Mortola, Italy, from the United States Department of Agriculture, the National Museum, and the Missouri Botanical Garden. Many valuable living plants, native to the southwestern United States, were secured by Professor Johnson while in that region last spring.

Mr. and Mrs. William F. Jones have donated to the Garden the very carefully prepared herbarium of plants of Maryland, Georgia and Louisiana developed by their son, the late W. Ralph Jones (A. B., 1906, Ph. D., 1911). The same donors have also given to the Botani-

cal Laboratory the valuable series of microscopic slides made by Doctor Jones.

The outdoor labels for showing the distribution of native trees have proven very successful. A series of similar labels indicating the geographical distribution of plants not native to North America is now in course of preparation.

The grading of the southeast corner of the Botanical Garden and the ground east and south of the greenhouses has now been completed, making a marked improvement in the drainage of the garden and in the appearance and utility of the ground south of the greenhouses. Considerable additions have been made during the year to the nursery of valuable shrubs and trees to be used about the grounds at Homewood when the location and construction of buildings is completed.

The usefulness of the Botanical Garden to members of the University and other Baltimoreans is evidenced by an ever-growing number of visitors, especially of students of the schools and colleges of the city.

PUBLICATIONS IN BOTANY

D. S. Johnson with H. H. York and H. S. Conard.

The Relation of Plants to Tide Levels: A Study of the Distribution of Marine Plants. *Publications of the Carnegie Institution of Washington*, No. 206, 162 pp., 24 plates and charts. December, 1915.

D. S. Johnson.

W. Ralph Jones: Biographical Sketch. *Johns Hopkins Alumni Magazine*, Vol. 4, p. 266, 1916.

Cinchona as a Tropical Station for American Botanists. *Science*, Vol. 43, p. 917.

Grace A. Dunn.

A Study of the Development of *Dumontia filiformis* *Plant World*, Vol. 19, pp. 277-281, 1916.

Needs of the Botanical Department.—The need for courses in bacteriology and plant pathology and the desirability of an adequate biological building at Homewood, pointed out in the report for 1914-15, are still our most important needs.

III. PLANT PHYSIOLOGY

Courses of lectures and elementary instruction.

The general orienting course on this subject (Course I of the *University Register*) was given this year in altered form, on account of the fact that but one student took this work. Many of the lectures were replaced by personal conferences and reading, directed by Professor Livingston. The general survey of this field by means of set experiments was carried out as usual, under the direction of Professor Livingston and Doctor Pulling.

The course on the application of plant physiology to other lines of study (Course III of the *University Register*) was given by Dr. Forest Shreve, of the Desert Laboratory of the Carnegie Institution

of Washington, assisted by Professor Livingston. Dr. Shreve's topic was "The relations of plant distribution to environmental conditions," so that his lectures covered a good part of the field of physiological plant ecology. It is planned that this course will not present the same sort of discussions from year to year, but will deal with the applications of plant physiology from different points of view according to occasion and opportunity. The University was very fortunate in being able to have the services of Dr. Shreve in this connection, and the Department of Plant Physiology wishes here publicly to express its gratitude to him for the donation of this course of lectures and cartographical demonstrations.

The course on special problems in plant physiology (Course II of the *University Register*) took the form, as has been usual heretofore, of personal conferences with students engaged in actual research, leading to orientation and the choice of problems for the doctor's dissertation. This work has been in charge of Professor Livingston and Doctor Pulling.

ADVANCED WORK

The lines of research that have been mentioned in previous reports of this Department have been followed still further during the year. During the summer of 1915, Professor Livingston was assisted in researches at the Desert Laboratory of the Carnegie Institution of Washington, at Tucson, Arizona, by Mr. E. S. Johnston, of this University. They investigated the behavior of the black and white spherical porous cups in atmometric measurements, the intense sunshine of the Tucson summer being especially suited to this work. Interest in these studies on radio-atmometry (evaporation as influenced by radiation; see earlier reports) centers about a definite need for a simple and adequate means of measuring solar radiation as it affects water loss from plants and animals, and further progress toward a solution of the problem is encouraging, though the complexity of the conditions involved and the difficulty of obtaining suitable black spheres render prolonged and sustained endeavor necessary. This work will be continued. In the studies just mentioned, carried out at Tucson in 1915, valuable financial and other aid was received from the Department of Botanical Research of the Carnegie Institution of Washington.

At Baltimore, Professor Livingston and Mr. Johnston have devised a simple attachment for the porous cup atmometer as usually employed, whereby it is possible to determine the evaporating power of the air at any place of exposure for a single minute. This has rendered the instrument available for studies of evaporation in relation to human welfare, especially as regards the problems of the ventilation of buildings.

Doctor H. E. Pulling, Instructor in this Department during the year, has continued his earlier studies on the power of soils to deliver water to plant roots or other absorbing surfaces. The technical difficulties here encountered are even greater and more complex than those met with in connection with plant water relations above the soil surface, but satisfactory progress is being made. Doctor Pulling has devised a simple instrument by which volume samples of field soils may be somewhat readily obtained, thus making it possible to

state soil moisture content on the basis of actual volume, rather than on that of dry weight, which has usually been customary.

Dr. J. W. Shive, University Fellow, 1913-15, who attained the Ph.D. degree of this University in June, 1915, continued his researches in this Laboratory until August, when he entered his work as Physiologist of the New Jersey Agricultural Experiment Station. He has completed an experimental study of the water and salt relations of wheat and of buckwheat when rooted in liquid media. The work upon wheat has now been published.

Dr. A. G. McCall, Fellow by Courtesy in this University, 1914-15, continued an investigation of the salt nutrition of plants in sand culture, begun here in 1913-14, and has now published his results. During this year Dr. McCall's work was carried on *in absentia*, at the Ohio State University. He attained the Ph.D. degree in the Johns Hopkins University in June, 1916, and is now in charge of Soil Investigations at the Maryland Agricultural Experiment Station.

Dr. F. T. McLean, who attained the Ph.D. degree in this University in June, 1915, completed a contribution on the comparative climatic conditions at Easton and Oakland, Maryland, which is now in press. He is now Instructor in Plant Physiology and Forestry in the University of the Philippines. The comparative measurements of climatic conditions and of plant growth obtained by Dr. McLean at ten other stations in Maryland have now been largely computed by Mr. F. M. Hildebrandt, who aims to make a second contribution from this same mass of data. Dr. McLean's work in this line and also Mr. Hildebrandt's until June, 1916, was carried out under the financial auspices of the Maryland State Weather Service. The data obtained in the summer of 1914 comprise growth measurements on four plant species, but those relating to soy bean are all that have thus far been subjected to computation and interpretation.

Mr. E. S. Johnston has had charge of the stock-room during the year, and has assisted Professor Livingston in other ways. He has begun a comparative study of the seasonal variations of climatic conditions in one of the experiment greenhouses of this Laboratory. This work began early in the spring of 1916, and is planned to continue throughout the entire year. With Mr. Johnston's assistance, Professor Livingston has devised a method for measuring the water absorption of plants as related to transpiration, thus bridging an important gap in the experimental analysis of the water relations of plants.

Mr. E. E. Free has continued his studies on the relation of the oxygen supply in the soil to the power of the plant to absorb water. He has also made a reconnaissance of the general subject of stimulation and injury produced by the presence of inorganic poisons in the soil, and has begun a study of certain phases of the molecular physics of protoplasm.

Mr. F. S. Holmes, in charge of Stone Fruits, at the Maryland Agricultural Experiment Station, has worked a portion of the time in this Laboratory and has made a study of the operation of the auto-irrigator (for the automatic maintenance of constant soil moisture content in pot cultures), the results of which will be of great value in the use of this instrument in connection with various problems of plant water relations.

Mrs. Edith B. Shreve, as research assistant to Professor Livingston during the winter, has made still further improvements upon the method of cobalt-chloride paper for measuring the power of leaves to give off water vapor, and this method has now become available for general use.

Mr. S. F. Trelease has carried out a study of the influence of ionic chlorine and of potassium chloride upon the growth of wheat and of Canada field pea, when growing in liquid media. Working with Mr. Free, he has also made a preliminary investigation of the injurious and stimulating effects of the element boron in cultures of the last-named plant in liquid media.

Professor Livingston has completed the editing of Miss Hopping's English translation of Palladin's *Pflanzenphysiologie* (see Report for 1914-15) and has made numerous editorial additions that seemed requisite. It is planned to publish this book in the near future.

He has also completed the prolonged climatic study of the United States, upon which he has been engaged for a number of years, as part of a collaboration with Dr. Shreve, upon the relations between climate and plant distribution in this country. The results of this joint research are nearly ready for publication.

Professor Livingston has also devoted considerable time, with Doctor Pulling, in preliminary studies of the literature of the geography and ecology of the Hudson bay region, and they have planned and prepared for a field excursion into this region for the summer of 1916.

Professor Livingston has also devoted considerable attention to the development of plans for the automatic control of temperature, air humidity, etc., for direct experimentation upon plant growth. It is planned to begin actual experimentation along these lines next year.

THE LABORATORY OF PLANT PHYSIOLOGY

The Laboratory was kept in use, by the researches of Dr. Shive, until August, 1915, and was idle for only two months, August and September. It is highly desirable that an establishment of this kind should be made use of as much as possible, in order to accomplish the maximum amount of research obtainable from the investment in building and apparatus. Furthermore, summer is the best season for many experimental studies in plant physiology, since plants grow better in summer than at other seasons. While it is not contemplated that summer instruction shall be given in this Department—this being obtainable in many other institutions—it is planned to utilize the facilities of the Laboratory for independent and more or less directed research during the summer months, whenever suitably qualified workers are available. By this method a larger output of good research is obtained from a comparatively small capitalization.

The equipment has been increased in various ways, but no large or expensive pieces of apparatus have been added this year. The securing of Doctor Pulling as Instructor in Plant Physiology has greatly increased the efficiency of the Laboratory as a whole, which was rapidly becoming too complicated to be managed by a single person. Mr. E. S. Johnston, Mr. S. F. Trelease and Mr. E. E. Free have served as research assistants.

The space available for advanced work has been used to the utmost this year, and the undertaking of a greater volume of work of this sort would result in crowding and loss of efficiency. There appears to be no decrease in the demand for advanced training in plant physiology, which is requisite for many lines of practical endeavor, and the number of students working here seems likely to increase rather than to decrease. More space will surely be needed in the very near future and the time has already come when the work demands a somewhat increased annual appropriation. In this connection it should be remarked that the increasing volume of research that has been reported during the past few years has been supported without any increase in the University appropriation available for this Department, private sources being drawn upon in certain cases. As soon as possible this matter should receive attention.

PUBLICATIONS IN PLANT PHYSIOLOGY

Bakke, A. L., and B. E. Livingston.

Further studies of foliar transpiring power in plants. *Physiol. Res.* 2: 51-71, 1916. (Work done at the Desert Laboratory, under the direction of B. E. Livingston.)

The progress of wilting as indicated by foliar transpiring power. *Carnegie Inst. Wash. Year Book* 14: 76. 1916.

Free, E. E.

Review of Taylor, The Chemistry of Colloids (New York, 1915). *Plant World* 18: 344-345. 1915.

Review of Report of Selby Smelter Commission. (U. S. Bur. Mines Bull. 98. 1915.) *Plant World* 19: 23-25. 1916.

An ancient bajada of the Great Basin region. *Carnegie Inst. Wash. Year Book* 14: 95. 1916.

Free, E. E., and B. E. Livingston.

The relation of soil aeration to plant growth. *Carnegie Inst. Wash. Year Book* 14: 60-61. 1916.

Johnston, E. S., and B. E. Livingston.

Measurement of evaporation rates for short time intervals. *Plant World* 19: 136-140. 1916.

Livingston, B. E.

A modification of the Bellani porous plate atmometer. *Science N. S.* 41: 873-874. 1915.

Physiological temperature indices for the study of plant growth in relation to climatic conditions. *Physiol. Res.* 1: 399-420. 1916.

A single index to represent both moisture and temperature conditions as related to plant growth. *Physiol. Res.* 1: 421-440. 1916.

Plane porous clay surfaces for use in atmometry. *Carnegie Inst. Wash. Year Book*, 14: 76. 1916.

Phototropism (?) of Urediniospore germ-tubes. (Review of Fromme, *Amer. Jour. Bot.* 2: 82-85. 1915.) *Plant World* 18: 172-194. 1915.

- Auto-irrigation of pots of soil for experimental cultures. *Carnegie Inst. Wash. Year Book* 14: 76. 1916.
- A new criterion for comparing physiological vigor in plants. (Review of Benedict, *Cornell Univ. Agric. Exp. Sta. Mem.* 7: 281-370. 1915.) *Plant World* 19: 114-116. 1916.
- Review of Shreve, the vegetation of a desert mountain range. (Carnegie Inst. Wash. Pub. 217. 1915.) *Science N. S.* 43: 821-823. 1916.
- Physiological indices of temperature efficiency for plant growth. *Carnegie Inst. Wash. Year Book* 14: 61-62. 1915.
- A simple climatic index. *Carnegie Inst. Wash. Year Book* 14: 62. 1915.
- Livingston, B. E., and E. S. Johnston.
Influence of solar radiation as a drying agent. *Carnegie Inst. Wash. Year Book* 14: 75. 1916.
- McLean, F. T.
Relation of climate to plant growth in Maryland. *Monthly Weather Rev.* 43: 65-72. 1915.
- McCall, A. G.
Field and laboratory studies of soils. Pp. viii + 133, figs. 54. New York, 1916.
A new method for the study of plant nutrients in sand cultures. *Jour. Amer. Soc. Agron.* 7: 250-252. 1915.
The availability of nutrient salts. *Jour. Amer. Soc. Agron.* 8: 47-50. 1916.
A method for the renewal of plant nutrients in sand cultures. *Ohio Jour. Science* 16: 101-103. 1916.
The absorption by soils of potassium from aqueous solution of potassium chloride. *Carnegie Inst. Wash. Pub.* 230: 167-175. 1915.
- McCall, A. G., F. M. Hildebrandt and E. S. Johnston.
The absorption of potassium by the soil. *Jour. Phys. Chem.* 20: 51-63. 1916.
- Shaw, C. F., and E. E. Free.
Agronomic and soil conditions in the Selby Smoke Zone. *U. S. Bur. Mines Bull.* 98: 451-473. 1915.
- Shive, J. W.
A study of physiological balance in nutrient media. *Physiol. Res.* 1: 327-397. 1916.
- Trelease, S. F.
Transpiring power of leaves. (Review of Bakke, *Jour. Ecol.* 2: 145-173. 1914.) *Plant World* 18: 222-224. 1915.
Balance in nutrient media. (Review of Tottingham, *Physiol. Res.* 1: 133-245. 1914.) *Plant World* 19: 145-147. 1916.

Trelease, S. F., and B. E. Livingston.

Foliar transpiring power and the Darwin and Pertz porometer. *Carnegie Inst. Wash. Year Book* 14: 76-77. 1916.

The daily march of transpiring power as indicated by the porometer and by standardized hygrometric paper. *Jour. Ecol.* 4: 1-14. 1916.

HERBERT S. JENNINGS,
Director of the Zoological Laboratory.

DUNCAN S. JOHNSON,
Director of the Botanical Laboratory.

BURTON E. LIVINGSTON,
*Director of the Laboratory
of Plant Physiology.*

ANIMAL PHYSIOLOGY

During the session of 1915-16 the following courses were given:

1. The Physiology of Digestion, Secretion and Nutrition. Professor Howell. *Twice weekly during the fall trimester.*
2. The Physiology of Muscle and Nerve and of the Special Senses. Professor Howell. *Twice weekly during the winter trimester.*
3. The Physiology of Blood, Circulation and Respiration. Associate Professor Hooker. *Twice weekly during the spring trimester.*
4. The Physiology of the Central Nervous System. Associate Professor Snyder. *Once weekly during the winter trimester.*
5. Laboratory Courses in Experimental Physiology. *Twelve hours weekly during the fall and spring trimester.* Drs. Howell, Hooker, Snyder and Drinker.

In addition to their teaching duties the members of the Staff have all been engaged in the study of special problems and in the direction of investigations by advanced students.

The following special workers have been engaged in these investigations under the direction of one or another of the members of the Staff:

Dr. Stanley Cobb—A study of the relation of the autonomic system to muscular tonicity. Dr. Cobb also engaged voluntarily in the work of the laboratory courses and rendered valuable assistance.

Miss Helene Connet, Fellow of Goucher College—A study of the hydrogen ion concentration of the blood as influenced by the character of the diet.

Mr. Jay McLean—A study of the relation of the phosphatids of the body to coagulation.

Mr. H. M. Mann—A study of the hemorrhagic condition produced in the isolated intestine by perfusion with defibrinated blood.

Mr. F. E. B. Foley and Mr. R. G. Coblentz—A study of the blood-pressure changes during respiration.

Mr. Arnold Rich—A study of the prothrombin reaction after varying periods of time.

PUBLICATIONS

W. H. Howell.

Structure of the fibrin-gel and theories of gel-formation. *American Journal of Physiology*, xl, 1916.

Text-book of Physiology, 6th edition, 1915.

D. R. Hooker.

The perfusion of the mammalian medulla: the effect of calcium and potassium on the respiratory and cardiac centers. *American Journal of Physiology*, 1915.

The influence of age upon the venous blood-pressure in man. *American Journal of Physiology*, 1915.

G. P. Denny and George R. Minot.

The origin of antithrombin. *American Journal of Physiology*, 1915.

The coagulation of blood in the pleural cavity. *American Journal of Physiology*, 1916.

C. K. Drinker and K. R. Drinker.

A method for maintaining an artificial circulation through the tibia of the dog, with a demonstration of the vaso-motor control of the marrow vessels. *American Journal of Physiology*, 1916.

The bone-marrow as a source of prothrombin. *American Journal of Physiology*, 1916.

F. E. B. Foley, R. G. Coblenz and C. D. Snyder.

On the determination of the character and quantity of the respiratory change of arterial pressure in man by means of the Korotkoff sounds. *American Journal of Physiology*, 1916.

I am glad to say that the crowded condition of the laboratory which was referred to in my last report bids fair to be remedied for the coming session. The contemplated removal of the library to the new Hunterian Laboratory will make two rooms available for the use of the physiological department.

W. H. HOWELL,
Professor of Physiology.

GREEK

The work of advanced instruction in Greek is carried on chiefly through the medium of the Greek Seminary, which is the laboratory in which the student is trained to use the apparatus of his profession and to carry out investigations of his own. Since the organization of the Seminary by Professor Gildersleeve, it has been the custom of the members to concentrate their attention in any one year on some leading author or some leading department of Greek literature. In pursuance of this custom the principal subject of study during the

past year has been the Greek Historians and more especially Thucydides. In addition to extensive reading in the Greek Historians, and an especial study of the style of Thucydides and Polybius, the work of the students consisted of the interpretation, along established lines, of selected passages of Thucydides. The execution of the tasks assigned necessitated, at times, the conduct of independent investigations, and it is hoped that some of these will lead to investigations on a larger scale in the future. The members of the seminary were required to present the results of their study and investigation in written and oral communications and the director and members met twice a week to hear and discuss these communications. To supplement and give further direction to the work of the seminary, the director, Professor Miller, conducted a series of weekly conferences on Greek Historiography, in which he devoted special attention to the style of the leading Greek historians, and interpreted the treatises of Dionysius of Halicarnassus on Greek historical criticism.

The members of the Greek seminary also had the advantage of a weekly course in Greek Historical Inscriptions, which was conducted by Professor Robinson, and they met twice a week under the leadership of Mr. J. C. Martin, University Fellow, for the systematic reading of Thucydides.

Besides lecturing to the seminary proper and directing its work, Professor Miller conducted the following graduate courses:

1. Readings in Greek selected from a wide range of literature, weekly during the first half-year. This course was designed to train the ear of the students and to stimulate their interest in diversified reading.

2. Weekly exercises in Greek composition throughout the year. This course was much more than a series of exercises in the selection of vocabulary and special idiom, and in the correct use of accents, forms, and syntax. It was also a course in synthetic rhetoric, and style was an element of prime consideration. A part of the course was devoted to practice in verse composition.

3. Palaeographical exercises twice weekly during the second term. The students received practice in the various styles of writing, including abbreviations, and should be able to read and collate Greek mss. with some degree of facility.

4. Weekly lectures, during the second term, on the syntax of the Greek tenses. These lectures embraced a discussion of the nomenclature and theory of the tenses, a survey of actual usage from Homer to modern Greek, and a presentation and discussion of problems still to be solved.

UNDERGRADUATE COURSES

Professor Miller:

Xenophon, *Memorabilia* (selections); Plato, *Apology*; Herodotus (selections); Prose Composition. *Four hours weekly, through the year.* (Greek 1.)

Professor Robinson:

History of Greek Literature. *One hour weekly, through the year.* (Greek 4.)

Collegiate Professor Spieker:

Bénner-Smyth's *Beginner's Greek Book*; Xenophon, *Anabasis*, I. *Three hours weekly, through the year.*

Homer, *Iliad*, I, II. *One hour weekly, through the year.*

Andocides, *de Mysterioris*; Lysias; Euripides, *Hippolytus*; Prose Composition. *Three hours weekly, through the year.* (Greek 2.)

Plato, *Protagoras*; Lyric Poets; Sophocles, *Oedipus Tyrannus*; Prose Composition. *Three times weekly, through the year.* (Greek 3.)

Thucydides, VII; Aristophanes, *Progs.* *Two hours weekly, through the year.* (Greek 4.)

Undergraduates have read privately for examination the following:

Xenophon, *Hellenica*, I.

Demosthenes, LIV, LV.

Lucian, *Vera Historia*, I.

Euripides, *Alceste*.

Aeschylus, *Prometheus*.

Plato, *Crito*.

Elegiac Poets (selections).

Homer, *Odyssey* (two books).

PUBLICATIONS

B. L. Gildersleeve.

Indiculus Syntacticus. *American Journal of Philology*, xxxvi (1915), 481-487.

ΟΠΩΣ and ΟΠΩΣ ΑΝ. xxxvii (1916), 210.

Reviews:

Carl Robert's *Oidipus*. xxxvi, 338-344.

Sir John Sandys' *The Odes of Pindar*. xxxvii, 88-92.

Rendel Harris' *The Origin of the Cult of Artemis*, xxxvii, 219-221.

Brief Mention, xxxvi, 358-369; 475-478; xxxvii, 107-121; 232-243, containing, among other things, the following:

On the Sexual Theory of the Cases. xxxvii, 108-109.

On 'Zeitart' or 'kind of time.' xxxvii, 112-113.

On Translating Pindar. xxxvii, 232-240.

Tribute to C. A. M. Fennell. xxxvii, 240-242.

Notices of:

Wilamowitz-Moellendorff's *Aeschyli Tragoediae*, xxxvi, 358-366.
 Francesco Guglielmino's *Arte e artificio nel dramma greco*, xxxvi, 366-369.

Rendel Harris' *The Origin of the Cult of Apollo*, xxxvii, 107.

Ridgeway's *The Dramas and Dramatic Dances of the Non-European Races in Special Reference to the Origin of Greek Tragedy*, xxxvii, 109-112.

Forman's *The Clouds of Aristophanes*, xxxvii, 113-115.

Lamb's *Clio Enthroned*, xxxvii, 116-121.

Cerrato's *Le Odi di Pindaro*, xxxvii, 242-243.

C. W. E. Miller:

Reports of *Rheinisches Museum für Philologie*:

Vol. LXX (1915), Nos. 1 and 2. *American Journal of Philology*, xxxvi (1915), 465-469.

Vol. LXX, No. 3. *Ibid.*, xxxvii (1916), 226-231.

Editorial work on the *American Journal of Philology*.

C. W. E. MILLER,
Professor of Greek.

LATIN

The Seminary, which is the most important organ of graduate instruction, consists of the director, fellows, and such graduate students as have given satisfactory proof of their ability and training. Each year special attention is given to some one department of the literature. During the session just completed the centre of work has been the Roman Epic, more particularly the Aeneid of Vergil. The members prepared papers founded upon various special investigations, and presented in turn critical and exegetical commentaries upon given passages of those authors. Two meetings a week were held, through the year.

In addition to the Seminary course and the auxiliary work, Professor Smith lectured once a week through the year on the Roman Epic from Naevius to Claudian. He also lectured once a week through the year on Apollonius of Rhodes and the Roman Poets. During the first half-year, he lectured once a week on the technical development of the Roman Hexameter; this was followed in the last half-year by a course of weekly lectures on Latin Syntax.

The members of the Seminary met once a week, through the year for the systematic reading of the Roman Epic Poets.

Undergraduate courses were conducted as follows:

Professor Smith:

Roman Literature (Latin III). *Weekly through the year.*

Collegiate Professor Mustard:

Latin I: Livy (selections); Vergil, *Bucolics*; Horace, *Odes*, bks. I and III; Latin Composition. *Four hours weekly, through the year.*

Latin II: Tacitus, *Annals*, bk. I; Pliny, *Epistles*, bk. VI; Catullus; Ovid, *Heroides*. *Three hours weekly, through the year.*

Latin III: Lucretius (selections); Vergil, *Georgics*, bks. I and II; Horace, *Satires* and *Epistles*. *Two hours weekly, through the year.*

Latin IV: Plautus, *Menaechmi*; Juvenal; Ovid (selections). *Two hours weekly, through the year.*

Latin V: Advanced Latin Composition. *Weekly through the year.*

During the year Professor Smith has also given lectures or addresses on the following occasions: December 29th, at Princeton at the Annual Meeting of the American Philological Association; February 26th at Boston before the Johns Hopkins Alumni Association of the New England States; March 25th at the Philadelphia Society for the Promotion of the Liberal Studies; April 8th before the Classical Club of Washington; April 15th before the Phi Beta Kappa Society, Baltimore; April 8th before the Mt. Vernon School for Boys; May 11th before the University Club of Baltimore; May 27th before the Classical Club of Baltimore; June 5th at the Quarter Centennial of the University of Chicago; June 8th, before the Boys' Latin School.

PUBLICATIONS

Kirby Flower Smith.

The Elegies of Albius Tibullus. New York [etc.] American Book Company, 1913.

Review of XAPITEZ Fr. Leo dargebracht. *American Journal of Philology*, xxxiv, pp. 206-214.

Note on Satyros' Life of Euripides. *American Journal of Philology*, xxxiv, pp. 62-73.

Review of Magnus, Ovid's Metamorphosen. *American Journal of Philology*, xxxv, pp. 207-211.

Hecate's Suppers. Hasting's *Encyclopaedia of Religion and Ethics*, vi, pp. 565-567.

Magic, Greek and Roman. *Hasting's Encyclopaedia of Religion and Ethics*, viii, pp. 289-289.

The Later Tradition of Vergil. *Classical Weekly*, ix, nos. 26 and 27, pp. 178-182; 185-188.

Notes on Tibullus. *American Journal of Philology*, xxxvii, pp. 132-156.

W. P. Mustard.

Notices, of Boccaccio's *Buccolicum Carmen*, ed. G. Lidonnici; of Bernardino Baldi's *Eloghe Miste*, ed. D. Ciampoli; and of Luigi Grilli's *Poeti umanisti maggiori*. *American Journal of Philology*, xxxvi, Dec. 1915, p. 479.

Later Echoes of Calpurnius and Nemesianus. *American Journal of Philology*, xxxvii, March, 1916, pp. 73-83.

KIRBY FLOWER SMITH,
Professor of Latin.

CLASSICAL ARCHAEOLOGY AND ART

The work in Classical Archaeology and Art has been carried on by means of the Archaeological Seminary, various courses of lectures and practical exercises, demonstrations in the museum of the University, and especially by means of conferences with individual students. The members of the Seminary, meeting weekly, devoted their attention to selected topics and problems in Hellenistic and Roman Sculpture.

In addition to his direction of the Seminary for the year, Professor Robinson lectured once a week through the year on Greek Historical Inscriptions; and once a week during the first half-year on Life and Art in the Mycenaean Age and their relation to Homer; and in the second half-year on Outlines of Greek and Roman Architecture. In the Greek Department he also lectured once a week on Greek Literature in English translations.

During the year Professor Robinson has also given a number of public lectures. At the November meeting of the Association of Colleges and Preparatory Schools of the Middle States and Maryland,

held in Philadelphia, he read a paper on "Ready Applications of Archaeology to School Teaching." He lectured to the Washington Classical Club on "A Visit to Asia Minor." He lectured to the Arundell and several other women's clubs on "Japan, Ancient and Modern"; to the Baltimore School Art League on "Japan and China," and again on "Art Instruction at The Johns Hopkins." He lectured on "The Seven Churches of Asia" before the Archaeological Society of Detroit, at Western Reserve University in Cleveland, and at the Toledo Art Museum. At the annual meeting of the Classical Association of the Atlantic States held in Philadelphia, he read a paper on "Caricature in Classical Literature and Art"; and at the annual meeting of the College Art Association in Philadelphia, he read on the subject "A College Museum of Reproductions." He, also, took part in the annual meeting of the American Philological Association, and of the Archaeological Institute which was held at Princeton.

Dr. Magoffin read a paper in the Classical History Section at the meeting of the American Historical Association at Washington during the holidays: during the spring of 1916, he gave a talk at the Maryland State Normal School at Towson on "An Archaeological Ramble from Provence to Pompeii"; and, also, to the Classical Club of Goucher College on "Roman Private Life," illustrating the talk with articles from the University Museum.

Dr. Magoffin lectured once a week through the year on Roman Palaeography, illustrating the history of writing from the capital and cursive through the various national hands, by means of photographs and facsimiles of ancient manuscripts. Practical exercise in identifying, dating, and reading various manuscripts was the chief work of the course.

The undergraduate course in Roman Life has been carried on for the most part by lectures supplemented by various kinds of illustrative material and by visits to the Museum, where Roman building materials, household utensils, coins, bronzes, and marbles were studied at first hand.

Lectures were given under the auspices of the Archaeological Society by Dr. Ales Hrdlicka of the United States National Museum, Garrett Chatfield Pier of the Metropolitan Museum, Professor H. Rushton Fairclough of Stanford, Professor Charles Knapp of Columbia, and Stephen Bleeker Luce, Jr., of the University of Pennsylvania Museum. Students of the Archaeological Department attended these lectures as part of their work.

Miss Bourne, who took her Ph. D. in Classical Archaeology in June 1914, and who was fellow by courtesy in 1914-1915, has published her dissertation on "A Study of Tibur—Historical, Literary and Epigraphical—From the Earliest Times to the Close of the Roman Empire." She has been appointed Instructor in Vassar for next year.

Needs.—The needs of the Department of Archaeology and Art, which was established only eleven years ago, and which has received inadequate appropriations, are great. Many of the important archaeological publications are lacking in the library and funds are especially needed to purchase photographs, to mount and care for those we have, and to buy some of the more expensive illustrated archae-

ological books, to provide a fine collection of lantern slides, and to purchase antiquities and casts to add to our excellent archaeological museum. Funds are also needed to publish a catalogue of the museum and especially of the beautiful collection of coins, which was recently presented by one of our former trustees, Mr. Buckler. Ultimately a chair of mediaeval and modern art should also be established. Money is needed for all these things and there are always many opportunities for archaeological research such as the excavation of Sardis, which has already yielded things of the highest artistic and linguistic importance, the inscriptions being published by Mr. Buckler and Professor Robinson.

PUBLICATIONS

David M. Robinson.

- Review of Hall's Aegean Archaeology. *American Journal of Philology*, xxxvi, 1915, pp. 345-346.
- Review of Goodyear's Greek Refinements. *Art and Archaeology*, ii, 1915, p. 33.
- Review of Davis' A Day in Old Athens. *Classical Weekly*, ix, 1915, p. 53.
- Review of Davis' Readings in Ancient History, vol. I Greece, vol. II Rome. *Classical Weekly*, ix, 1915, pp. 53-55.
- Review of Beggs' The Four in Crete. *Art and Archaeology*, iii, 1916, p. 123.
- Review of Myres' The Metropolitan Museum of Art: Handbook of the Cesnola Collection of Antiquities from Cyprus. *Art and Archaeology*, iii, 1916, p. 124.
- Review of Richter's The Metropolitan Museum of Art: Greek, Etruscan and Roman Bronzes. *Art and Archaeology*, iii, 1916, p. 244.
- Review of Fairbanks' Greek Gods and Heroes as Represented in the Classical Collections of the Museum of Fine Arts, Boston. *Art and Archaeology*, iii, 1916, p. 244.
- Review of Pennell's Pictures in the Land of Temples. *Classical Weekly*, ix, 1916, p. 216.

Ralph V. D. Magoffin.

- Review of A. Rosenberg's "Der Staat der alten Italiker." *American Journal of Philology*, xxxvi, 1915, pp. 209-211.
- Review of G. Bloch's "La République romaine." *American Journal of Philology*, xxxvi, 1915, pp. 212-213.
- Review of S. Gasselee's "A Collotype Reproduction of that Portion of Cod. Paris 7989 commonly called the Codex Traguriensis which contains the Cena Trimalchionis of Petronius, etc." *American Journal of Philosophy*, xxxvi, 1915, pp. 213-215.
- The Roman Campagna. *Art and Archaeology*, ii, 1915, pp. 34-35.
- The Archaeological Collection of the University. *The Johns Hopkins Alumni Magazine*, iv, no. 1, pp. 27-33.
- Review of R. L. Ashley's "Ancient Civilization." *Classical Weekly*, ix, 1916, pp. 87-88.

The Archaeological Collection of The Johns Hopkins University. *Classical Weekly*, ix, 1916, pp. 99-101.

Review of M. B. Ogle's "A Catalogue of Casts of Ancient and Modern Gems in the Billings Library, University of Vermont." *Art and Archaeology*, iii, no. 1, p. 60.

Current Notes and News. *Art and Archaeology*, iii, no. 2, pp. 118-119, 121-122; no. 3, p. 181; no. 4, pp. 236-238; no. 5, pp. 295-297.

The Freedom of the Seas, or The Right which Belongs to the Dutch to Take Part in the East Indian Trade. A Dissertation by Hugo Grotius. Translated with a revision of the Latin text of 1633. Carnegie Endowment for International Peace, Division of International Law. Oxford University Press. 1916. Pp. xv, 83.

DAVID M. ROBINSON,

*Professor of Classical Archaeology and Epigraphy,
Lecturer on Greek Literature.*

SANSKRIT AND COMPARATIVE PHILOLOGY

During the session of 1915-16 advanced work in Indology was concerned with three topics: first, the Vedic Brāhmaṇas and Upaniṣads; secondly, Sanskrit poetry; thirdly, Buddhist literature.

The theological treatises called Brāhmaṇa are the analog of the Hebrew Talmud, that is, exposition of the Vedic sacrificial ceremonial, interspersed with ancient legends. These texts are fundamental both for ancient religious practice and for Hindu legendary narrative (story of the flood; Urvāci-legend, analogous to the Undine, Melusine, and Lohengrin motifs; etc.). Aside from the light which these texts throw upon the priestly practices and lore of ancient India, they are important because written in connected prose—the earliest prose in the domain of Indo-European speech.

The Upaniṣads are the texts of the Veda's high religion and philosophy. They contain the beginnings of Hindu monism, the form of Brahmanical philosophy which, under the name of Vedānta, controls at the present time nearly all the higher thought of Brahmanical India. The broad aspects of both Brāhmaṇa and Upaniṣad literature were studied in relation to Hindu literature in general; representative texts of both classes were read and analyzed critically.

As representing standard Sanskrit poetry the recently published Pārçvanātha Carita was chosen. The text is quasi-historical, but is in the main devoted to parabolic fiction, connected with the lives of Jaina Saints and Emperors. The great story of the adventures of King Vikrama as a parrot in the third book of Pārçvanātha was used as a basis of investigation of the epopee of that famous legendary monarch; the type of fiction involved in this legend was treated by Professor Bloomfield in a paper offered to the American Philosophical Society under the caption, 'On the art of entering another's body, a motif of Hindu fiction.'

Dr. Burlingame, Johnston Scholar in Sanskrit, conducted an advanced course in Pāli, the classical language of the Southern Buddhists. Selected readings from the Buddhist canon and studies in Pāli lexicography resulted in two papers presented by Dr. Burlingame to the American Oriental Society at its meeting in Washington in April 1916.

An elementary course in Classical Sanskrit, carried on during the session by Professor Bloomfield, was devoted to Sanskrit Grammar and the interpretation of an easy text. This course served also as an introduction into the methods of Comparative Grammar.

The work in Comparative Philology was two-fold. First, the annual course of lectures on General Comparative Philology. This began with a definition of the theme and its relation to History, followed by a sketch of the history of the science. The bulk of the lectures dealt with the linguistic ethnology of the Indo-European peoples, their divisions, special interrelations, and their original home (the so-called Aryan question). This was followed by sketches of the individual peoples of the family: India, the Vedas, Brahmanism, Sanskrit Literature, and Buddhism; Persia, the Achaemenian cuneiform inscriptions, Zoroastrian literature (Avesta) and religion; the minor and problematic Indo-European peoples; and, finally, similar sketches of the European peoples and their national religions.

A course of lectures, weekly thru the year, was given in the elements of the Comparative Grammar of the Indo-European languages. The subject treated was the history of the noun-suffixes (formation of noun-stems), with particular reference to Greek, Latin, Teutonic, and Sanskrit.

At the annual meeting of the American Oriental Society Professor Bloomfield read a paper, 'On Vedic cruces in grammar, text, and interpretation'; Dr. Burlingame a paper 'On the truth-act, a motif of Hindu fiction,' and another, 'On the Pāli word *anamatagga*'; Mr. W. Norman Brown a paper on the bibliography of Hindu folklore collections.

PUBLICATIONS

Maurice Bloomfield.

On the Etymology and Meaning of the Sanskrit Root *varj*. *Journal of the American Oriental Society*, xxxv, 273-288.

On two cases of Metrical Shortening in fused long syllables. 'Aufsätze zur Kultur- und Sprachgeschichte, Ernst Kuhn zum 70. Geburtstag gewidmet.'

On recurring Psychic Motifs in Hindu Fiction, and the Laugh and Cry Motif. *Journal of the American Oriental Society*, xxxvi.

MAURICE BLOOMFIELD,

Professor of Sanskrit and Comparative Philology.

ORIENTAL SEMINARY

In the Oriental Seminary, under the direction of Professor Haupt, twenty-six courses in the various departments of Oriental research were given during the past year, special attention being paid to the Old Testament and the cuneiform inscriptions bearing on the Scriptures.

Seventeen hours, throughout the year, were devoted to the study of *Hebrew and the Old Testament*. In the *Old Testament Seminary*, two hours weekly, through the year, Professor Haupt gave a critical interpretation of the Book of Amos. He also conducted, through the year, a series of weekly exercises in *Hebrew Prose Composition*, the students translating idiomatic English sentences into Hebrew. Dr. Blake gave, weekly through the year, a course in *Hebrew Phonology*, preceded by a sketch of the elements of phonetics. Associate Professor Ember conducted a course in the elements of *Hebrew Grammar*, three hours weekly, through the year, while the instruction in *Hebrew for Beginners*, also three hours weekly, through the year, was given by Dr. Blake. Mr. Rabinowitz met a class, weekly, through the year, for the *Cursory Reading of the Hebrew Bible*, and a series of *Hebrew Exercises* was conducted, weekly, through the year, by Dr. Steinbach. Dr. Rosenau gave a course in *Third Year's Hebrew*, two hours weekly, through the year, and a course in *Post-Biblical Hebrew*, through the year, the students reading selections from the Mishnah and the Talmud. Two series of lectures on Biblical topics were given by Mr. Russell, on *Biblical Archaeology*, through the year, and on the *Literature of the Old Testament* during the second half year. He also met a class for the *Interpretation of Selected Chapters of the Authorized Version* during the first half year.

The lectures on the *History of the Ancient East* (Egypt, Babylonia, Assyria, Persia, Israel, Judah, and the minor nations of Western Asia, preceded by a sketch of the prehistoric period) were given, through the year, by Dr. Blake.

In *Arabic*, Professor Haupt conducted weekly exercises in *Arabic Prose Composition*, supplemented during the second half year by exercises in *Syriac and Ethiopic Prose Composition*. Associate Professor Ember gave courses in the *Koran*, two hours weekly, during the first half year, and one hour weekly during the second; in *Jewish Arabic*, two hours weekly, through the year, and in the *Makamat of Hariri*, one hour weekly, during the second half year. A course in cursory reading of the *Arabian Nights* was conducted, through the year, by Mr. Rabinowitz.

In *Ethiopic*, an elementary course was given by Dr. Blake, through the year.

Six hours weekly, through the year, were devoted to the study of *Assyriology*. Professor Haupt interpreted the eleventh tablet of the *Babylonian Nimrod Epic*, and gave a course in *Sumerian Grammar*, supplemented by the reading of selected *Sumerian Hymns and Psalms*. He also conducted a series of weekly exercises in *Assyrian and Sumerian Prose Composition*, the students translating from Hebrew and Arabic into Assyrian, and from Assyrian into Sumerian.

The instruction in *Elementary Assyrian* was given by the Rayner Fellow in Semitic, Dr. Albright, two hours weekly, through the year, while Dr. Duncan gave courses in *Cursory Reading of Assyrian Inscriptions* during the first half year, and in *Babylonian and Sumerian Contracts*, one hour weekly during the first half year, and two hours weekly during the second.

In *Egyptology*, during the first half year, Associate Professor Ember met a class for the reading of selected *Hieroglyphic Texts*, and devoted two hours weekly to the study of *Pyramid Texts and Hieratic Papyri*. During the second half year two hours weekly were devoted to the *Pyramid Texts* and one to *Hieratic Papyri*.

The instructors and advanced students of the Oriental Seminary met weekly, through the year, to present new discoveries and reports on important articles in the leading Oriental journals.

At the meeting of the University Philological Association on November 19 Professor Haupt delivered the presidential address on Beer and Brandy in Babylonia. He also presented a number of minor communications: on February 18 he discussed Professor Hrozný's decipherment of the Hittite documents of Boghaz-keui; on March 17, Bartholomae's criticism of Hrozný's theory; on April 14, Luther's translation of the Bible; on May 19, Elysium, Elishah and Alasia. Associate Professor Ember read the following brief communications: on January 21, The conception of the soul in the form of an owl among the ancient Egyptians and the pagan Arabs; on February 18, Semitic words surviving in Egyptian sign-values; on April 14, Amharic names for parts of the body. On February 18 Dr. Duncan read the principal paper on The Contributions of Professor S. R. Driver to Old Testament Learning, to which Professor Haupt added some remarks on the memorial volume which he had planned to publish on the seventieth anniversary of Driver's birthday, October 2, 1916. On March 17 Dr. Duncan presented a brief communication on a Sumerian clay tablet recently found at Tello.

At the annual meeting of the Society of Biblical Literature and Exegesis in New York, December 27-28, Professor Haupt presented the following papers: (a) The Curse on the Serpent; (b) Astarte's Azure Necklace; (c) Was Amos a Sheepman? (d) The Ship of the Babylonian Noah.

At the general meeting of the American Philosophical Society, Philadelphia, April 15, Professor Haupt discussed The Isles of the Blest.

At the annual meeting of the American Oriental Society, held in Washington, April 24-26, eighteen papers were presented by members of the Oriental Seminary, viz., Professor Haupt: (a) The Plant of Life; (b) Shalman and Beth-arbel; (c) Tones in Sumerian; (d) Open Sesame. Associate Professor Ember: (a) Remarks on the Phonetic Values of Several Egyptian Alphabetic Signs; (b) New Semito-Egyptian Words; (c) Obsolete Semitic Words in Egyptian. Dr. Rosenau: Some Notes on Akathriel. Dr. Blake: (a) The Glottal Catch in Tagalog; (b) The Expression of Indefinite Pronominal Ideas in Ethiopic; (c) The Hebrew Vowel Seghol. Dr. Albright: (a) Some Misinterpreted Passages in the Cuneiform Flood Tablet; (b) The Eighth Campaign of Sargon. Dr. Steinbach: Arabic *thamtham*, to stop. Mr. Rabinowitz: The Original Sequence of the Songs of

the Return. Mr. Russell: Biblical Paronomasia. Mr. Bloomhardt: The Poems of Haggai. Mr. Snyder: The Cromlech of Bethel.

To commemorate the centennial of the American Bible Society, which was organized in New York on May 9, 1816, Professor Haupt delivered a lecture on The Origin of Our Bible, in McCoy Hall, May 9.

Dr. Rosenau lectured on a number of topics before several Baltimore institutions, and also delivered lectures, under various auspices, in New York, Philadelphia, Washington, Pittsburgh, Cincinnati, St. Louis, Detroit, Newark, N. J., Hazleton, Pa., Memphis, Tenn., Richmond, Va., and at the following universities before certain student bodies: University of Michigan, University of Cincinnati, Yale University.

Dr. Duncan delivered the following lectures in Washington: on January 17, before the Ministers' Association of Washington: The Contributions of Professor Driver to Old Testament Learning, with an exhibit of Professor Driver's writings; on May 2 and 5, at the American University, Washington: The Sumerians in Mesopotamia, 5000-2000 B. C. and Archaeology and The Old Testament, 2000-500 B. C.—both with stereopticon views.

The Rayner Fellow in Semitic, W. F. Albright, and the University Fellow, Reuben Steinbach, received the degree of Ph. D., at the end of the session. Dr. Albright's subjects were Assyriology, Arabic, and History of the Ancient East; the title of his dissertation was *The Assyrian Deluge Epic*. Dr. Steinbach submitted a dissertation on *The Book of Obadiah*; his subjects were Hebrew, Arabic, and Egyptology. About the end of March Dr. Albright was elected Thayer Fellow at the School of Archaeology in Jerusalem.

PUBLICATIONS

Paul Haupt.

Hosea's Erring Spouse. *Journal of Biblical Literature*, vol. 34, pp. 41-53.

The Hebrew noun *melkh*, counsel. *Journal of Biblical Literature*, vol. 34, pp. 54-70.

To know = to have sexual commerce. *Journal of Biblical Literature*, vol. 34, pp. 71-76.

Assyrian *atmu*, fledgling in the Old Testament. *Journal of Biblical Literature*, vol. 34, pp. 77-82.

Hosea's Birthplace. *Journal of Biblical Literature*, vol. 34, pp. 182-183.

The Semitic root *lak*, to press. *Journal of Biblical Literature*, vol. 34, pp. 183-184.

Hebrew *zed*, haughty = Assyrian *sittu*, remnant. *Journal of Biblical Literature*, vol. 34, pp. 184-185.

Semachonitis = Jungled Region. *Journal of Biblical Literature*, vol. 34, pp. 185-186.

Cuneiform Message to Hon. Mayer Sulzberger, of Philadelphia, on the occasion of his retirement from the Judiciary. *Old Penn*, Weekly Review of the University of Pennsylvania, vol. 14, No. 17 (Philadelphia, Jan. 22, 1916), p. 560.

Assyrian *ramku*, priest = Heb. *komer*. *American Journal of Semitic Languages*, vol. 32, pp. 64-75.

- Hebrew *evyónâ*, soul. *American Journal of Semitic Languages*, vol. 32, pp. 141-143.
- The Hebrew Names for Ostrich. *American Journal of Semitic Languages*, vol. 32, pp. 142-143.
- Assyrian *lâm iṣṣûri ṣabâri*, before the birds cheep. *American Journal of Semitic Languages*, vol. 32, pp. 143-144.
- Beer and Brandy in Babylonia. *Johns Hopkins University Circulars*, No. 287 (July, 1916), pp. 32-33.
- Professor S. R. Driver. *Johns Hopkins University Circulars*, No. 287 (July, 1916), p. 41.
- The Hittite Documents of Boghaz-keui. *Johns Hopkins University Circulars*, No. 287 (July, 1916), p. 41.
- Bartholomae's criticism of Hrozný's theory of the Indo-European character of the Hittite language. *Johns Hopkins University Circulars*, No. 287 (July, 1916), p. 42.
- Luther's Translation of the Bible. *Johns Hopkins University Circulars*, No. 287 (July, 1916), pp. 43-44.
- Elysium, Eliahah, and Alasîa. *Johns Hopkins University Circulars*, No. 287 (July, 1916), pp. 46-47.
- Assyrian *irrâ*, Mohn. *Zeitschrift für Assyriologie*, vol. 30, pp. 60-66.
- Das fünfte sumerische Familiengesetz. *Zeitschrift für Assyriologie*, vol. 30, pp. 93-96.
- Assyrian *tuppû*, warten, aufziehn = Hebrew *tippah*. *Zeitschrift für Assyriologie*, vol. 30, pp. 96-99.
- Assyrian *cutammu*, Siegelstecher. *Zeitschrift für Assyriologie*, vol. 30, pp. 99-100.
- Assyrian *ṣabû*, Amphora. *Orientalistische Literaturzeitung*, vol. 18, pp. 96-97 (October, 1915).
- Hebrew *lēvêd*, Tontafel. *Orientalistische Literaturzeitung*, vol. 18, p. 324 (November, 1915).
- Der Korngrünfutterschnittmonat. *Orientalistische Literaturzeitung*, vol. 18, pp. 359-361 (December, 1915).
- Das Land Ub. *Orientalistische Literaturzeitung*, vol. 19, pp. 45-46 (February, 1916).
- Aaron Ember.
- The etymological equivalent in Egyptian of the common Semitic word for life. *Orientalistische Literaturzeitung*, vol. 19, pp. 72-75 (March, 1916).
- The conception of the soul in the form of an owl among the Ancient Egyptians and the pagan Arabs (abstract). *Johns Hopkins University Circulars*, No. 287 (July, 1916), p. 37.
- Semitic words surviving in Egyptian sign-values (abstract). *Johns Hopkins University Circulars*, No. 287 (July, 1916), pp. 39-40.
- Amharic names for parts of the body (abstract). *Johns Hopkins University Circulars*, No. 287 (July, 1916), p. 44.

PAUL HAUPT,

W. W. Spence Professor of the Semitic Languages
and Director of the Oriental Seminary.

ENGLISH

1. Advanced Courses.

The advanced students in English are organized into a Seminary, which is conducted by Professor Bright. Graduate students are admitted to the Seminary as soon as they have satisfied initial requirements for specialization and research. The discipline of the Seminary is designed to impart training in scholarly methods of dealing with literary and linguistic problems. Study and investigation are bestowed on selected periods of literary and linguistic history, on departments of literature extending through successive periods, and on the works of important writers, taken separately or in groups. Usually there is a change of subject each half-year. During the academic year 1915-1916, the sessions of the Seminary occupied four hours a week.

One continuous subject, the pre-Shakespearian drama, was investigated during the year. The first third of the year was devoted to the origin and development of the Liturgical Plays, and about an equal portion of time then brought the subject to the end of the Miracle Plays; thereafter a representative list of the Moralities was studied. Recent investigations and critical judgments relating to various aspects of the comprehensive subject received special attention in reports that were presented and discussed.

Professor Bright met a class once a week for the discussion of problems in Middle English Grammar.

He also interpreted the text of *Beowulf* to a class that met twice a week.

He gave a course in Anglo-Saxon (twice a week) that was to serve as an introduction to the technical methods of linguistic science.

The Journal Club of the Seminary was conducted by Professor Bright. Sessions of two hours on alternate Fridays were held for reports of the linguistic and literary contributions in the Journals.

2. College Courses.

English Composition 1, a prescribed course in Rhetoric and English Composition, was given, three hours weekly, through the year. The class met in four sections, which consisted at organization of about twenty-eight men each. Section 1 was taught by Associate Professor French, Sections 2 and 3 by Dr. Myers, and Section 4 by Mr. Janney. The work of the course included, besides the study of the principles of prose composition, the regular writing of themes and essays, the reading month by month of certain prescribed works in prose and verse, and, on the more important of the essays, private conferences with the instructors. Lomer and Ashmun's *The Study and Practice of Writing English* was used as a text-book of Rhetoric, and Francis C. Lockwood's *The Freshman and His College* served at the same time as a collection of specimens of expository prose and a source of helpful advice to first-year students.

Dr. Myers and Mr. Janney conducted, once a week, classes in English Composition 2, prescribed for all students graded less than "8"

in English Composition 1. The principles of structure and diction were reviewed, and practice in writing was afforded by weekly themes, which were criticised in class. The text-books used were J. W. Linn's *Essentials of English Composition* and Lomer and Ashmun's *The Study and Practice of Writing English*.

Associate Professor French gave an elective course in the Forms of Public Address (English Composition 4), three hours weekly, through the year. The course consisted of a study of the principles of exposition and argument with much practice both oral and written. During the last third of the year the class studied American orations and debates, giving special attention to the Lincoln-Douglas Debates of 1858. Percival and Jelfe's *Specimens of Exposition and Argument* was used.

English Literature 1 was conducted by Professor Greene, three hours a week, through the year. This class made a general survey of English Literature from the beginning until about 1600. A considerable amount of the poetry of Chaucer and of Spenser was studied critically in the class-room, and more was privately read by members of the class: Books XVIII-XXI of Sir Thomas Malory's *Morte Darthur* and Book II of Sir Thomas More's *Utopia* were also included in the private reading. In addition to the regular class-room exercises, five readings from the poems of Chaucer were given for the benefit of those members of the class who wished to attend them.

English Literature 2 was given by Professor Greene, three hours a week, through the year. During the first half-year a careful study was made of the minor poems of Milton and of Book I of *Paradise Lost*; Books II-IV were privately read by the members of the class. The second half-year was spent in the study (a) of English forms of verse, (b) of the writings of Dryden, Steele, Addison, and Pope, and (c) of some of the literary features of the English Bible.

English Literature 3 was given by Professor Greene, three hours a week, through the year. During the first term a study was made of the English and Scottish Popular Ballads, and of the poems of Burns and Scott. During the remainder of the year the course included a study of poetry as represented in the writings of Wordsworth, Coleridge, Byron, Keats, and Shelley, and of the novel as represented in the writings of Scott and Dickens. In connection with the weekly lectures and discussions the members of the class did a large amount of private reading and prepared six papers.

English Literature 5 (prescribed for technological students) was conducted by Dr. Myers, three hours a week, through the year. The course included a general survey of English literature from the beginning to 1837. Special study was devoted to the works of selected authors (Chaucer, Spenser, Milton, Dryden, Wordsworth, Keats, and Browning) and to the development of certain types of literature and forms of poetry. L. H. Holt's *The Leading English Poets from Chaucer to Browning* was used as a text-book.

Public Speaking 1, a course in Reading and Public Speaking prescribed for undergraduate students in their second year, was given, one hour a week, through the year. The class was divided into eleven sections of about nine men each. Five of these sections were taught by Associate Professor French and six by Mr. Albert L. Hammond.

The first term was devoted to a study of the elementary principles of expression as illustrated in the reading of Browning's shorter poems. The second and third terms were given to the study and practice of the occasional speech, both prepared and extemporaneous. Knapp and French's *The Speech for Special Occasions* was used as a textbook.

Public Speaking 2, an elective course in Debate, was conducted, one hour a week through the year, by Associate Professor French. The course included lectures on argumentation, class debates and written arguments, and lectures on parliamentary law. J. H. Gardiner's *The Making of Arguments* and Robert's *Rules of Order* were used as textbooks.

The "Adams Contest," held on January 28, afforded additional practice in public speaking and debate. Contestants for the Adams medal, chosen from the Class of 1918 by a preliminary contest, and the debating teams of the Classes of 1916 and 1917, also chosen by competitive tests, were trained in delivery by the instructors in public speaking. The Adams trophy and individual prizes were won by the Class of 1916, and the Adams medal was won by Mr. Morton K. Rothschild. The annual intercollegiate debate with the University of Virginia and the University of North Carolina was held on Saturday, April 29. The Johns Hopkins speakers won the first place in the league, defeating Virginia three to two, and winning a unanimous decision against North Carolina. The oratorical contest of the colleges of Maryland and the District of Columbia, under the auspices of the Intercollegiate Peace Association, was held in McCoy Hall, March 24. The first prize was won by the speaker for Loyola College.

3. College Courses for Teachers.

A course for teachers, designed to cover practically the same ground as the college course in English Composition 1, was given by Dr. Myers. The class met twice a week from October 12 to June 1. Lomer and Ashmun's *The Study and Practice of Writing English* and F. C. Lockwood's *The Freshman and His College* were used as textbooks.

A course in Oral English (English II) was given by Associate Professor French. The class met twice a week from October 12 to June 1. The work of the course was similar in character to that of Public Speaking 1.

4. Public Lectures.

The twenty-first course of the Percy Turnbull Memorial Lectures on Poetry was delivered by Mr. Paul Elmer More, March 29-April 12, 1916. The course consisted of seven lectures on Poets of America: (1) The Spirit and Poetry of Early New England; (2) Emerson; (3) Whittier and Longfellow; (4) The Influence of New York; (5) Three Poets of the South; (6) Sidney Lanier; (7) The Modern Movement.

PUBLICATIONS

James W. Bright.

Anglo-Saxon *umbor* and *seld-guma*. *Mod. Lang. Notes*, xxxi, 82-84.
Beowulf 489-490. *Mod. Lang. Notes*, xxxi, 217-223.

Necrology: James Mercer Garnett. *Am. Jour. of Phil.*, xxxvii, 244-247.

Brief Mention of the following books: W. L. Phelps, Robert Browning: How to know him;—Zupitza-Schipper, Alt- und Mittelenglisches Uebungsbuch;—O. F. Emerson, A Middle English Reader;—Albert S. Cook, A Literary Middle English Reader;—H. H. Williams, Jacke Jugeler;—I. Gollancz, The Parlement of Three Ages;—R. W. Chambers, Beowulf, with the Finnsburg Fragment;—Lilian Winstanley, The Faerie Queen: Books I and II;—K. Sisam, The Lay of Havelok the Dane;—W. W. Greg, The Assumption of the Virgin: a Miracle Play from the N-Town Cycle;—Tucker Brooke, Common Conditions. *Mod. Lang. Notes*, xxxi, January-June (1916).

John C. French.

The Authorship of the 'Sot-Weed Factor.' *Mod. Lang. Notes*, xxxi, 58-59.

Class-Room Use of the Occasional Speech. *The Quarterly Journal of Public Speaking*, ii, 2.

Review of F. C. Lockwood, The Freshman and His College; M. G. Fulton, College Life: its Conditions and Problems; and Richard Rice, The College and the Future. *Mod. Lang. Notes*, xxxi, 297-299.

JAMES WILSON BRIGHT,
Caroline Donovan Professor
of English Literature.

GERMAN

The German Seminary, which is organized for study and research in Modern and Middle High German Literature and Language, met three times weekly through the year under the guidance of Professor Wood. During the first half-year, the period of "Storm and Stress" in German Literature (1772-1785) was treated in its more important phases, with particular reference to Goethe and Klinger. During the second half-year, the poems of Walther von der Vogelweide were studied.

The Germanic Seminary, which has for its object the philological study of the Old Germanic languages and the historical study of German grammar, was conducted by Professor Collitz and met twice weekly, through the year. In the first half-year the subject of the exercises, viz., the critical reading of difficult Gothic texts, was to a certain extent a continuation of the course in Gothic given in the preceding year. The texts interpreted consisted of selections from the second Epistle to the Corinthians and from the so-called *Skeireins* (a Gothic commentary to the Gospel of St. John). In the second half-year Old High German was substituted for Gothic. A prominent place was given to the reading of selections from Otfrid, not only for the sake of practice in O. H. G. (Otfrid being a rather difficult author), but above all because Otfrid's *Book of the Gospels* lends itself conveniently to a discussion of various philological

questions and to an illustration of philological methods in text criticism and interpretation. Next to Otfried's work and for similar reasons, the O. H. G. translation of Isidor's treatise *Contra Judaeos* received particular attention. Several hours were set aside for the reading, by members of the Seminary, of papers on grammatical and etymological subjects. Among the latter, those by Mr. Scharf on the names of the turkey in English and German and by Mr. Schaffer on the Germanic names of the horse deserve special mention.

The Germanic Society, which is conducted by Professors Wood and Collitz, held five meetings through the year, at which the following papers were read and discussed:

Dr. A. L. T. Starck, *Die Deutschen Sagen* der Brüder Grimm als Balladenquelle. Stephan George und sein Kreis; Mr. Aaron Schaffer, Lessing and the Litteratur-Briefe; Professor Wood, Literary Adaptations in Gerhart Hauptmann's *Versunkene Glocke*; Miss Elizabeth F. Johnson, The Eclogues of Georg Rudolf Weckherlin; Mr. Carl Scharf, Wieland's *Don Sylvio de Rosalva*; The Passage from Pietism to Realism in the author's development.

Professor Wood gave a graduate course, twice weekly, first half-year on the Beginnings of German Classicism. The subjects considered included Wieland's epic romances, as illustrating the development of German poetic style; Lessing's earlier dramas, Lessing's and Herder's fundamental essays in literary criticism, and Klopstock's early odes. During the second half-year, the period of Romanticism in German Literature was studied.

Professor Wood read, with a class of undergraduates, twice weekly, through the year, Goethe's *Faust*, *Iphigenie* and *Götz von Berlichingen*. In the Winter Classes for Teachers, he conducted a course twice weekly in the study of the German drama from Heinrich von Kleist to Otto Ludwig.

In the Summer Courses (1916), Professor Wood conducted two classes:

1. Swabian and Austrian Poets in the First Half of the Nineteenth Century.

The period from Uhland to Mörike was considered in its chief representatives. Particular attention was given to the relation of the Swabians to Young Germany and to Heine. Among the Austrian poets, Grillparzer and Lenau were specially studied.

2. Two Epochs of Reform in German Language and Style.

The period of the *Sprachgesellschaften*, and of Purism in German Style was studied in detail (XVII century), after which the contest between the Swiss-German and Leipzig literary schools was treated, and the resulting triumph of naturalism in German style illustrated, particularly in the poems of Haller (XVIII Century).

The following graduate courses were given by Professor Collitz:

1. Introduction to the Study of Germanic Philology: One hour weekly through the year. This course included mainly a review of the sources for our knowledge of the various Old Germanic languages and a discussion of the aims and methods of the comparative study

of these languages, stress being laid on the intimate connection between comparative Germanic and comparative Indo-European philology.

2. Gothic Grammar. Twice weekly through the year. For the study of the Germanic languages, a knowledge of Gothic is no less important than is an acquaintance with Sanskrit for that of the cognate Indo-European languages. In both cases we are concerned with a single language that must serve as the starting point and the basis for the study of a whole group, because its records belong to an earlier period and its grammatical forms accordingly are more ancient than those of the cognate languages. Under these circumstances it appears advisable not to confine a course in Gothic to a mere practical training in this language, but to combine it, as much as possible, with a comparative study of Early Germanic grammar. The comparison, moreover, will naturally extend from the Germanic to the cognate Indo-European languages, because, e. g., such fundamental features of the Germanic group as the ones generally designated by the names of "Grimm's law" and "Verner's law" cannot be explained without reference to languages like Latin, Greek, or Sanskrit. With these aims in view the course in Gothic was conducted.

3. Old High German. Twice weekly, first half-year. A course for beginners in Old High German. With the aid of Braune's *Abriß der ahd. Grammatik*, the most essential features of the various OHG. dialects were presented, special attention being given to East Franconian on account of its close relation to the Modern German literary language. Selections from Braune's *Ahd. Lesebuch* were read for practice in translation.

4. Old Frisian. One hour weekly, second half-year. The Old Frisian language claims our interest above all by its close relationship to two other Old Germanic languages: Old Saxon (the language of the *Heliand*) and Anglo-Saxon. Its similarity with the latter is especially striking, so much so that Anglo-Saxon may be regarded—from a grammatical point of view—as an Old Frisian dialect detached at an early date from its former surroundings. For our purposes, it seemed sufficient to select for special study the records of one of the Old Frisian dialects, viz., that of Rustringen, now easily accessible in Heuser's *Altfries. Lesebuch*.

Associate Professor Kurrelmeyer gave the following graduate courses:

Middle High German (Introductory Course). *Two hours weekly, first half-year*. After a rapid survey of Middle High German Grammar, Hartman von Aue's *Armer Heinrich* was read, followed by selections from the *Nibelungenlied*.

Goethe's Earlier Poems. *One hour weekly, second half-year*. After an exposition of the principles of textual criticism, and their particular application to Goethe, the students, individually, were required to establish and comment upon the text of selected poems.

Associate Professor Kurrelmeyer gave the following undergraduate and special courses:

1. Elementary German. *Four hours weekly, through the year.* Vos, *Essentials of German*; Whitney and Stroebe, *Easy German Prose Composition*; Gerstäcker, *Germelshausen*; v. Wildenbruch, *Das edle Blut*; Betz, *Aus der Jugendzeit*.

2. German 4. Contemporary Literature in rapid readings. *Three hours weekly, through the year.* C. F. Meyer, *Das Amulet, Der Heilige*; v. Ebner-Eschenbach, *Die Freiherrn von Gemperlein, Krambambuli*; Keller, *Die drei gerechten Kammacher, Frau Regel Amrain, Kleider machen Leute*; Grillparzer, *Sappho, Die Ahnfrau*; Heibel, *Agnes Bernauer, Herodes und Mariamne*; Ludwig, *Der Erbfürster*.

3. Historical German Readings. *Two hours weekly, through the year.* Loening and Arndt, *Deutsche Wirtschaft*; Schiller, *Geschichte des dreissigjährigen Krieges*, III. Buch; Freytag, *Doktor Luther*.

4. Scientific German Readings. *Two hours weekly, through the year.* Lassar-Cohn, *Die Chemie im täglichen Leben*; Walther, *Allgemeine Meereskunde*; v. Helmholtz, *Naturwissenschaftliche Vorlesungen*.

Dr. R. B. Roulston, Associate in German, gave the following undergraduate courses:

German 1, Section A. Modern Prose Readings. *Three hours weekly.* Arnold, *Einst im Mai*; Saar, *Die Steinklopfer*; Meyer, *Das Amulet*; Wildenbruch, *Neid*; Storm, *Karsten Kurator*; Loening and Arndt, *Deutsche Wirtschaft*; Fontane, *Grete Minde*.

German 1, Section B. *Three hours weekly.* Arnold, *Einst im Mai*; Storm, *Auf der Universität*; Schurz, *Lebenserinnerungen*; Frenssen, *Peter Moor*; Hoffmann, *Das Fräulein von Scuderi*.

German 1, Sections A and B. Prose Composition. *Weekly.* Whitney and Stroebe, *Easy German Composition*, Exercises 13-33.

German 1, Sections A and B. Private Reading. Baumbach, *Das Habichtsfraulein*; Raabe, *Else von der Tanne*.

German III. Prose Composition. *Weekly.* Whitney and Stroebe, *Easy German Composition*. Exercises I, 35-48; III, 1-3; V, 1-5.

German II. College Courses for Teachers. Modern Prose Readings. Prose Composition. *Three hours weekly.* Storm, *Der Schimmelreiter*; Arnold, *Einst im Mai*; Schurz, *Lebenserinnerungen*; Loening and Arndt, *Deutsche Wirtschaft*; Sudermann, *Der Katzensteg*; Whitney and Stroebe, *Easy German Composition*. Exercises 7-35.

Summer Courses: German 3. *Two hours weekly.* A study of the life and works of Heinrich von Kleist.

German 4. Modern Prose Readings. *Weekly.* Roedder, *Schwarzwaldeut'*; Eichendorff, *Aus dem Leben eines Taugenichts*; Keller, *Romeo und Julia auf dem Dorfe*.

German 5. Elementary German. Vos, *Essentials of German*.

PUBLICATIONS

Henry -Wood.

Literary Adaptations in Gerhart Hauptmann's "Versunkene Glocke." *Germanistic Society Quarterly*, Vol. III (1916), pp. 1-32, 56-74.

Hermann Collitz.

Review of Sipma, Phonology and Grammar of Modern West Frisian (London, 1914): *Modern Language Notes*, Vol. xxx (1915), pp. 215-217.

Goethe's use of *vergakelt*: *Modern Language Notes*, Vol. xxxi (1916), pp. 75-78.

HENRY WOOD,
Professor of German.

ROMANCE LANGUAGES

1. Graduate Courses.

Professor Armstrong conducted courses in the history of the French language as follows: Pronunciation of French, weekly; History of Sounds and Inflections, three hours weekly, second half-year; Historical Syntax, weekly; Gallic Folk Latin, three hours weekly, first half-year. He also gave a weekly course of selected readings in Old French literature, and a weekly course in Provençal lyrics.

Professor Marden conducted the following courses: Early Spanish Drama, weekly; Readings in Old Spanish, weekly; Spanish Historical Grammar, two hours weekly.

Professor Brush conducted a weekly course in French Romanticism and Realism.

Associate Professor Shaw conducted courses in the Interpretation of Selections from Classic Italian Authors, weekly; and on the Poems of Guido Cavalcanti, weekly.

Mr. Carcassonne conducted courses in French literature as follows: L'Évolution du roman au XVIII^e siècle; Les Questions sociales dans la littérature de 1830 à 1848; Les Essais de morale et de critique de Renan (each weekly); and Explication d'auteurs français (two hours weekly).

The staff and graduate students of the department assembled weekly in the Romance Journal Club for reviews of recent scientific literature and the presentation of papers of departmental interest.

The Seminary in the French Language met two hours fortnightly, under the direction of Professor Armstrong. On the basis of the manuscript scheme established in the Seminary of 1913-1914, and of the 240 lines constituted in 1914-15, 364 lines of the unpublished Old French metrical version of *Barlaam et Josaphat* were constituted, that section of the poem being selected for which there is the fullest manuscript material, so that the work of the year might form the soundest basis practicable for a later constitution of the less fully documented sections. In addition to participating in the text constitution, the members of the Seminary all presented papers on grammatical or lexicographical problems arising in connection therewith.

The Seminary in French Literature met two hours fortnightly, under the direction of Mr. Carcassonne, and was devoted to the study

of Balzac. The principal purpose was to seek in Balzac's own life the source of certain of his novels. An effort was made to determine the extent of the resemblance existing between several heroes of the *Comédie humaine* and the author, and to see in what way Balzac utilized the reminiscences and suggestions arising from his own experiences. This led also to a critical examination of certain points in his biography, of certain aspects of his character, and of his methods of observation and invention.

The Seminary in Spanish met for two hours weekly, under the direction of Professor Marden, for the purpose of studying the language and versification of the *Libro de Apolonio*. The members of the Seminary investigated various questions of dialect, morphology, syntax, and meter of this Spanish poem, and constituted a critical text for some seventy stanzas.

In addition to the scheduled courses, the following lectures were given before the department:

Professor F. M. Warren: "Notes on the Early History of the French National Epic"; Professor T. F. Crane: "The Exempla as Illustrating Medieval Imagination"; Professor J. Merlant; "Balzac"; Professor Christian Gauss: "Rousseau's *Contrat Social*"; Professor R. Jaen: "Estudios españoles en Madrid."

2. Collegiate Courses.

French Elements, three sections, each four hours weekly: Sections A and C, by Dr. Ingraham; Section B, by Mr. Worthington (Sections B and C were for students in Engineering). French 1, two sections, each four hours weekly, by Professor Brush and Mr. Worthington; French 2, three hours weekly, by Professor Brush; French 3-4, three hours weekly, by Professor Brush; French 5, weekly, by Mr. Worthington.

Spanish 1, three hours weekly, by Professor Marden; Spanish 2, three hours weekly, by Dr. Ingraham.

Italian 1 and Italian 2, each three hours weekly, by Associate Professor Shaw.

3. College Courses for Teachers.

French 1, the Elements of French, three hours weekly, by Professor Shefloe. French 2, Intermediate French, two hours weekly, by Mr. Hastings, and French 3, Advanced French, two hours weekly, by Professor Armstrong. Spanish, two hours weekly by Professor Marden. Italian, two hours weekly, Associate Professor Shaw.

EDWARD C. ARMSTRONG,
Professor of the French Language,
Chairman.

HISTORY

SEMINARY IN AMERICAN HISTORY

The seminary in American History was conducted by Professor Latané. The work of the first semester was devoted to the period of Reconstruction. Among the reports made were the following: "Reconstruction in Virginia," by E. L. Fox; "Reconstruction in North Carolina," by W. P. M. Weeks; "Reconstruction in South Carolina," by W. K. Gotwald; "Reconstruction in Georgia," by F. Bowers; "Reconstruction in Alabama," by W. K. Woolery; "Reconstruction in Mississippi," by P. R. Fossum; "Reconstruction in Louisiana," by H. D. Welsh; "Lincoln's Views on the Civil and Political Status of the Negro," by S. A. Guerrant; "Charles Sumner's Part in Reconstruction," by Elizabeth Merritt; "Andrew Johnson," by W. C. Guess; "Carl Schurz's Report on Conditions in the South," by W. B. Schulz; "Grant's Attitude Toward Reconstruction," by S. R. Gammon; "Opinions Delivered by Chief Justice Chase During the Reconstruction Period," by A. Aston; "Stanton's Part in Reconstruction," by C. C. Thach; "Blaine's Part in Reconstruction," by J. K. Dunlap. During the second semester the topic under consideration was American Diplomacy in the Orient, and the following papers were presented: "The Mission of Edmund Roberts," by W. C. Guess; "English Relations With China to the Outbreak of the Opium War," by Elizabeth Merritt; "Causes and Results of the Opium War," by J. K. Dunlap; "The Mission of Caleb Cushing," by C. C. Thach; "Exterritoriality in China," by W. P. M. Weeks; "Perry's Visit to Japan," by W. K. Gotwald; "The Taiping Rebellion," by S. R. Gammon; "The Mission of Anson Burlingame," by F. Bowers; "Chinese Immigration and Exclusion," by S. A. Guerrant; "Relations with Hawaii," by E. L. Fox; "The Samoan Question," by W. B. Schulz; "Christian Missions in China," by A. Aston; "The Open-Door Policy in China," by H. D. Welsh; "Japanese-American Relations Since the Boxer Uprising," by W. K. Woolery; "Anti-Japan Agitation in California," by P. R. Fossum.

The following lecture courses were given by Professor Latané:

1. American History Since the Civil War. *Two hours weekly, first half year.* A study of the constitutional and political problems of Reconstruction and the expansion and growth of the reunited nation.
2. American Diplomacy in the Orient. *Two hours weekly, second half year.* A study of the opening of China and Japan to foreign intercourse, the American policy of Chinese exclusion, the rapid rise of Japan to a position of influence as a world power, the Boxer uprising and the intervention of the Powers in China, the open-door policy advocated by the United States, the Manchurian question, the Russo-Japanese war, and the present diplomatic situation in regard to China.
3. American History,—for Undergraduates (History 4). *Three hours weekly, through the year.* A general course covering the whole field of American history, based on lectures, textbooks and assigned readings.

SEMINARY IN EUROPEAN HISTORY

Professor Vincent conducted the seminary in European History. The general subject under consideration was the condition of government and society in France just previous to the French Revolution. The sources to which particular attention were given were the Cahiers de Doléances which were prepared for the States-General in 1789. The extensive material published by the French Government was at the command of the seminary, and to each member was assigned a particular district for his special study. Reports upon particular phases were given from time to time, the whole year being devoted to careful investigation. Emphasis was laid particularly upon conditions in municipalities, but comparative studies of rural conditions were also included.

Professor Vincent also conducted a lecture course for graduates upon the history of the French Revolution during the first half year, and during the second half year continued with the early history of the nineteenth century.

An undergraduate course in English History, held three times weekly throughout the year, covered the general development of constitutional and legal history of that country down to the present time.

Professor Vincent also conducted an afternoon class in the courses for teachers, given twice weekly, the subject being the history of the French Revolution and the Early Nineteenth Century. In both of these courses textbooks, lectures, essays and reports from students were employed.

During the year Professor Vincent was occupied as a member of the Council of the American Historical Association, and as President of the History Teachers' Association of the Middle States and Maryland, and as President of the History Teachers' Association of Maryland. He gave addresses at various times upon topics relating to European History.

Dr. Charles Downer Hazen gave the following graduate course:

The Republican Movement in France. *One hour a week through the year.*

Dr. Ralph V. D. Magoffin conducted the following courses:

1. History of Greece from the Peloponnesian War to the Destruction of Corinth. *One hour weekly, through the year.* Particular attention was paid to the political side of Greek history, the federal experiments of the Achæan and Ætolian leagues, and to Greek influence in the East as seen in Alexander's conquests and the rule of the Diadochi.

2. History of Italy and Rome from the earliest times to the year 387 B. C. *One hour weekly, through the year.* This period was considered from the point of view of historical criticism evaluated by comparison with the new discoveries in early Italian and Etruscan archæology and with the recent studies in early Roman religion.

3. History of Greece and Rome,—for Undergraduates (History 1). *Three hours weekly, through the year.* The constitutional, political, social, economic and artistic developments of Greece and Rome were traced by means of translated texts of the ancient historians with the aid of modern authorities. Reports on special topics, with map drawing on the part of the students and occasional lectures on the part of the instructor, served to expand and emphasize the important phases of this history.

The lectures on the Albert Shaw Foundation were delivered by Mr. Edward Porritt, of Hartford, Conn., a well-known journalist and writer on political science. His subject was "The Diplomatic History of the International Waterways Between the United States and Canada from the Treaty of Washington of 1871 to the End of the Trouble Over the Welland Canal in 1893."

The lectures on the Albert Shaw Foundation delivered by Professor William R. Manning, of the University of Texas, in 1913, were issued by the Johns Hopkins Press, under the editorial supervision of Professor Latané, under the title "Early Diplomatic Relations Between the United States and Mexico," pp. xi, 406.

The December (1915) number of the Johns Hopkins University Circular bears the title "Publications of Members and Graduates of the Departments of History, Political Economy and Political Science, 1901-1915." This bibliography is a continuation of that contained in the memorial volume published in 1902, shortly after the death of Herbert B. Adams. The new bibliography contains not only the names of the men who were students under Dr. Adams, many of whom have published their most important contributions since his death, but it contains the names of the graduates of the past fourteen years who have made any noteworthy contributions in their respective fields.

PUBLICATIONS

John H. Latané.

Our International Outlook. Address at Commencement Exercises of the College of Charleston, May 19, 1915, published in full in the *Charleston News and Courier*, May 23, 1915.

America and the World Crisis. Annual Address before the forty-eighth annual meeting of the Maryland State Teachers' Association, published in the *Proceedings*, pp. 34-42.

The Sale of Arms and Munitions of War as Affecting the Status of Neutrals. *Proceedings of the American Society of International Law*, 1916.

Review of A. B. Hart's "The Monroe Doctrine: An Interpretation." *American Political Science Review*, May, 1916, pp. 370-372.

Review of R. G. Usher's "The Challenge of the Future: A Study in American Foreign Policy." *American Political Science Review*, May, 1916, pp. 373-374.

Ralph V. D. Magoffin.

Review of A. Rosenberg's "Der Staat der alten Italiker." *American Journal of Philology*, vol. xxxvi, 1915, pp. 209-11.

- Review of G. Bloch's "La République romaine." *American Journal of Philology*, vol. xxxvi, 1915, pp. 212-213.
- Review of S. Gasselee's "A Collotype Reproduction of That Portion of Cod. Paris 7989 Commonly Called the Codex Traguricensis, Which Contains the Cena Trimalchionis of Petronius, etc." *American Journal of Philology*, vol. xxxvi, 1915, pp. 213-215.
- The Roman Campagna. *Art and Archaeology*, vol. ii, 1915, pp. 34-45.
- The Archæological Collection of the University. *The Johns Hopkins Alumni Magazine*, vol. iv, No. 1, pp. 27-33.
- Review of R. L. Ashley's "Ancient Civilization." *Classical Weekly*, vol. ix, 1916, pp. 87-88.
- The Archæological Collection of the Johns Hopkins University. *Classical Weekly*, vol. ix, 1916, pp. 99-101.
- Review of M. B. Ogle's "A Catalogue of Casts of Ancient and Modern Gems in the Billings Library, University of Vermont." *Art and Archaeology*, vol. iii, No. 1, p. 60.
- Current Notes and News. *Art and Archaeology*, vol. iii. No. 2, pp. 118-119, 121-122; No. 3, p. 181; No. 4, pp. 236-238; No. 5, pp. 295-297.
- The Freedom of the Seas, or the Right Which Belongs to the Dutch to Take Part in the East Indian Trade. A dissertation by Hugo Grotius. Translated with a revision of the Latin text of 1633. Carnegie Endowment for International Peace, Division of International Law. Oxford University Press, 1916, pp. xv, 83 (i. e. 166).

JOHN H. LATANÉ,
Professor of American History.

POLITICAL ECONOMY

The instruction in Political Economy was directed by Professor Hollander, who met students daily in seminary organization for formal study and for co-operative research. The courses were designed to afford systematic instruction in general economic principles, intimate acquaintance with special fields of economic activity, and, most important of all, knowledge of and ability to employ sound methods of economic research. Dr. George E. Barnett, Professor of Statistics, and Dr. N. R. Whitney, Instructor in Political Economy, assisted in the conduct of the work.

Economic Seminary. The students following political economy as a principal subject for the degree of Doctor of Philosophy met weekly under the direction of Professors Hollander and Barnett. The work of the year centered in the investigation of representative forms of industrial development in the United States, and in the analysis of significant activities of American labor organizations. The papers and reports presented to the Seminary were as follows: "Out-of-Work Benefits," by D. P. Smelser; "The Cost of Living as a Wage Principle," by J. N. Stockett; "Four Chains of Five- and Ten-Cent

Stores," by Kemper Simpson; "The System of Conferences in the Iron and Steel Trade," by J. S. Robinson; "Inter-Local Methods of Securing Employment," by D. P. Smelser; "Conditions precedent to the Erection of Cotton Mills in the South," by Broadus Mitchell; "Historical Sketch of the Lumber Industry," by H. F. Holtzclaw; "Economic Theorizing and Scientific Progress," by Professor Hollander; "The Exchange Mechanism in Operation between the United States and Japan," by Masuyo Chinda; "The Cost of the War," by Professor Barnett; "Local Methods of Securing Employment," by D. P. Smelser; "An Introduction to the Study of the Standard of Living in Japan," by K. Morimoto; "Trade Agreements and Industrial Education," by Professor Barnett; "Productive Efficiency," by J. N. Stockett; "The Clothing Strike at Hamburger's," by Dr. Leo Wolman; "The Trade Union Theory of Unemployment," by D. P. Smelser; "Labor as a Factor in the Establishment of Southern Cotton Mills," by Broadus Mitchell; "Government of the Iron, Steel and Tin Worker's Union," by J. S. Robinson; "The Rise of the New Industrial Promotions," by Kemper Simpson; "Timber Bonds," by H. F. Holtzclaw; "Statistics of Unemployment in the United States," by D. P. Smelser; "The Problem of Unemployment," by D. P. Smelser; "Productive Efficiency," by J. N. Stockett; "The Effect of the War upon the Economic Life of Japan," by Masuyo Chinda; "Jurisdiction in the Iron, Steel and Tin Workers' Union," by J. S. Robinson; "The Cost of Living in Japan," by K. Morimoto; "Profit Sharing," by Boris Emmett; "The Rise of Cotton Mills in the South: How Capital was Secured," by Broadus Mitchell.

Appreciable progress has also been made by members of the Seminary in the study of special aspects of the several questions assigned for investigation. During the summer field work was carried on in various carefully selected localities, and the data thus collected have since been supplemented and corrected by documentary study and personal interview.

Professor Hollander conducted the following courses of lectures:

1. The Theory of National Prosperity. *Two hours weekly during the year.* A critical study was made of the doctrine of national well-being with particular reference to current affairs.
2. The Theory of International Trade. *Two hours weekly during the year.* The theory of international exchange was studied in the light of the stirring developments of the European War.

Professor Barnett lectured during the year on the history, administration and financing of industrial corporations.

Professor David A. McCabe, of Princeton University, delivered a course of five lectures on "Trade Agreements in the Pottery Industry."

Professor Moritz J. Bonn, of the University of Munich, delivered two lectures on "The Idea of Self-sufficiency in Economic Theory."

Professor L. S. Rowe, of the University of Pennsylvania, delivered two lectures on "The Effect of the European War on the Countries of South America."

A reading class was organized and successfully conducted by the

more advanced students of the department for the co-operative study of economic texts and for the critical discussion of current literature.

The Seminary collection of economic texts was strengthened by purchases from the Hutzler fund, the McPherson fund and the Glenn fund.

Professor Hollander, Professor Barnett, and Dr. Whitney conducted the following undergraduate courses:

Political Economy I. *Three hours weekly, through the year.* In the first half-year the industrial development of England and the United States was studied. In the second half-year systematic instruction was given in the elementary principles of economic science.

Political Economy II. *Three hours weekly, through the year.* In the first half-year the theory and practice of finance were considered. In the second half-year the principles of monetary science were taught.

Political Economy III. *Three hours weekly, through the year.* In the first half-year the theory and methods of statistics were given in advanced economic theory.

The prime purpose of the Department of Political Economy is to train qualified students in methods of economic research so that either as teachers or as investigators they may add to the sum of human knowledge in the field of economic relations. It is believed—and this constitutes the distinctive characteristic of economic study at Johns Hopkins—that this training can only be successfully given by the student's coming into immediate contact, through observation and interview, under proper guidance, with actual economic facts. A quasi-historical study based exclusively upon documentary materials and library apparatus will not afford this training. The student must be trained to investigate and understand the actual working of an existing economic institution.

The successful conduct of economic instruction of this kind requires the use of a Research Fund, comparable to the laboratory appropriations available in the natural sciences. It is required to some extent for the collections of documentary material essential to such investigations, but lying beyond the range of ordinary library purchases. The larger occasion for such a fund is, however, to enable the students at a certain period in their training to continue their investigations by actual field work, this involving repeated visits to and frequent residence in the particular localities where the phenomena under investigation are found in typical form. Without the aid of such a fund the ordinary student is practically obliged to limit his inquiry to a local phenomenon or to remain content with an imperfect induction.

The Johns Hopkins University has from time to time been requested to institute courses of instruction in subjects of direct interest and value to young men actually engaged in, or contemplating entrance into, business, industry, and commerce, and to make such instruction available at hours and under conditions that would meet the convenience of those likely to make use thereof. During the present year this desire took the form of a definite application from a

group of young men who presented in very earnest manner the occasion which exists for such instruction. The authorities of the University having signified their willingness to offer such instruction, provided that the funds necessary for the additional expenditure be assured for a term of years, this same group of young men, under the intelligent leadership of Mr. H. E. Treide, Jr., a graduate of this University, secured pledges of sums of money from various business enterprises of Baltimore sufficient in aggregate to make possible a substantial advance in this direction. Accordingly, the Johns Hopkins University will offer during the academic year 1916-17 a series of evening "Courses in Business Economics," under the general direction of the Department of Political Economy.

PUBLICATIONS

Publications by members of the department during the year were as follows:

J. H. Hollander.

Economic Theorizing and Scientific Progress. *The American Economic Review*, March, 1916 [Supplement], pp. 124-139.

G. E. Barnett.

The Stone Cutters' Union and the Stone Planer. *Journal of Political Economy*, May, 1916, pp. 417-444.

Trade Agreements and Industrial Education. *Proceedings of the National Society for the Promotion of Industrial Education*, January, 1916, pp. 347-361.

JACOB H. HOLLANDER,
Professor of Political Economy.

POLITICAL SCIENCE

The work in Political Science has been directed by Professor Willoughby, and has had for its primary purpose the preparation of advanced students for professional and original work in the fields of constitutional law, international law and diplomacy, and political theory. The instruction has also aimed to supply a training for students desiring to enter the higher branches of the public service, as well as to furnish a philosophical equipment to those who expect to pursue the study and practise of the law.

Professor Willoughby has continued to act as the managing editor of *The American Political Science Review*, now in its tenth volume.

Seminary and Journal Club. A weekly seminary and journal club was held, devoted to the consideration of reports upon dissertations, the discussion of current questions in constitutional and international law, and reviews of scientific publications in the field of political science.

Mr. Edward Porritt gave a course of six lectures dealing with "The Development of the English Imperial Idea."

Professor Willoughby gave the following graduate lecture courses:

1. United States Constitutional Law (in continuation of the course given in 1914-1915). *Three hours weekly, until Christmas.*
2. Legal Aspects of Economic and Industrial Problems. *Three hours weekly, from Christmas until Easter.*
3. Introduction to Political Philosophy. *Three hours weekly, beginning after the Easter holidays.*
4. Comparative Constitutional Law. An undergraduate course to juniors and seniors. Mr. Millspaugh, Fellow in Political Science, assisted in this course. *Three hours weekly, first half-year.*

Dr. J. B. Scott gave the following lecture courses:

1. The Peaceable Settlement of International Disputes. *One hour weekly, through the year.*
2. The Forcible Settlement of International Disputes. *One hour weekly, through the year.*

In submitting this report of the work in Political Science during the academic year 1915-1916, I desire to repeat what I had to say in my report for the year 1914-1915 with regard to the most urgent needs of the department, if it is to increase its work and influence.

First of all, it would seem to be imperative that provision be made for undergraduate instruction in Political Science. It may be possible for the present head of the department to furnish a certain amount of undergraduate instruction, but if there is to be adequate undergraduate teaching, an instructor must be provided. Such an instructor, if appointed, might also give at least one graduate course and assist in the work of the Political Science Seminary.

Upon the graduate side there is urgent need: (1) that there be established a chair of Government and Administration; and (2) that instruction in International Law be placed upon a more definite and permanent basis.

An inspection of the titles of the graduate courses now being offered will show that no provision whatever is made for systematic instruction in that great branch of Political Science which has to deal with forms of governmental organization (central and local, national and colonial) and the problems involved in their effective administration. These are questions of the greatest scientific as well as of practical interest, and it is most unfortunate that they do not receive adequate consideration in this University.

As regards International Law and Diplomacy, it may be said that the generosity of a friend of the University has permitted provision to be made for two hours a week graduate instruction by Dr. James Brown Scott. It is understood that this gift will not be continued, and it is therefore necessary that some permanent provision be made for at least one graduate course in this field. If an instructor were added to the staff of the department, it is possible that he could give this course.

W. W. WILLOUGHBY,
Professor of Political Science.

PHILOSOPHY

Graduate Courses

The following graduate courses have been given:

3. *The Philosophy of Kant.* The *Kritik der reinen Vernunft* was critically analyzed in lectures and class-room discussions, especial attention being paid to the *Transcendental Analytic of Principles*. In the light of this examination of Kant's text an attempt was made to determine the historical tenability and the philosophical value of the principal types of Kant-interpretation.

4. *Schopenhauer and Nietzsche.* The course was designed largely to illustrate certain methods of historical analysis, as applied to the exegesis and the evaluation of the work of philosophers whose doctrines are to a peculiar degree syntheses of originally unrelated ideas drawn from many historic sources. Especial consideration was given to the significance of both Schopenhauer and Nietzsche as latter-day representatives of tendencies originating chiefly in the philosophy of Romanticism. The course was thus a sequel to courses given in previous years on the eighteenth century Enlightenment and the Romantic Period.

6. *Contemporary Tendencies in Metaphysics.* The course was devoted to a study of the development of objective idealism in English and American philosophy since 1885, the greater part of the second half-year being given to the metaphysical writings of Royce.

The subjects of individual study of the student members of the Philosophical Seminary were as follows: R. H. Dotterer: Vaihinger's "Philosophie des als ob," with especial consideration of its bearing upon the philosophy of religion; Helen H. Parkhurst: Recent "objectivistic" theories of the import of the concept and of the judgment, with especial reference to Meinong and Husserl; Alvin Thalheimer: Studies of some of the logical and psychological problems relating to the experience of time.

The Graduate Conference has met four times during the year, and has heard and discussed the following papers or addresses: "What was Kant's Chief Contribution to Philosophy?", Professor Norman Kemp Smith, of Princeton University; "Recent Logical Realism," Miss Helen H. Parkhurst; "The Nature of Space," Professor Theodore de Laguna, of Bryn Mawr College; "Some Problems of Legal Philosophy," Professor Morris R. Cohen, of the College of the City of New York. The meeting addressed by Professor Cohen was arranged for by the departments of Political Science and Philosophy jointly. Opportunity for the informal discussion of philosophical questions by advanced students in this and other departments has continued to be provided throughout the year by the monthly meetings of the Philosophical Discussion Club.

Undergraduate Courses

Undergraduate courses in Logic and Ethics were conducted during the year by Dr. Slonimsky, the logic extending to February first, and

the ethics to June. The aim of the course in logic, in its deductive part, was to give practical training in precise thinking; in its inductive part, a study was made of the main methods of scientific generalization and the conditions of proof. The course in ethics was devoted to a brief history of moral progress, an analysis of the principles of conduct, and an application of the results of ethical reflection to actual questions of the day. Dewey and Tufts' text-book was used.

A course in the Outlines of the History of Philosophy, extending throughout the year, was given by Dr. Slonimsky. The work consisted of lectures, and papers and discussions on assigned reading in the sources.

PUBLICATIONS

A. O. Lovejoy.

(With E. R. A. Seligman and others.) Report of the Committee on Academic Freedom and Academic Tenure of the American Association of University Professors. Baltimore, December, 1915. Pp. 29.

(With Davis R. Dewey and others). Report of the Committee of Inquiry on the Case of Professor Scott Nearing of the University of Pennsylvania. *Bulletin of the American Association of University Professors*, ii, No. 3, Part 2, pp. 57, May, 1916.

Methods of the Board of Regents of the University of Utah. *School and Society*, iii, pp. 314-316.

The American Association of University Professors. *The Nation*, Feb. 10, 1916. Pp. 169-170.

As to the Embargo on Arms. *New Republic*, Sept. 11, 1915. Pp. 156-157.

Review of Sorel's "Reflections on Violence." *American Political Science Review*, x, (1916). Pp. 193-195.

Review of Cheydeur's "Essai sur l'évolution des doctrines de M. Georges Sorel." *Modern Language Notes*, xxxi (1916). Pp. 360-363.

R. H. Dotterer.

Miracles and Christianity. *Reformed Church Review*, Oct., 1915.

The Theory of Value Implied by Schopenhauer's Pessimism. *Reformed Church Review*, April, 1916.

Mary W. Hoyt.

The Tyranny of Benefactors. *Hibbert Journal*, April, 1916.

A. O. LOVEJOY,
Professor of Philosophy.

PSYCHOLOGY

During the year 1915-1916, advanced courses in objective psychology and experimental psychology were conducted by Professor Watson. Associate Professor Dunlap gave courses in genetic psychology, history of psychology, and social psychology. Dr. Lashley conducted a course in animal behavior.

PUBLICATIONS

John B. Watson.

The Place of the Conditioned Reflex in Psychology (Presidential address before the American Psychological Association). *Psychological Review*, March, 1916, 89-116.

The Fake Element in Vocational Psychology. *The Baltimore News*, April 22, 1916.

Edited *The Journal of Experimental Psychology*, 1916-

Edited *Animal Behavior Monographs*, 1914-

Knight Dunlap.

Thought Content and Feeling. *Psychological Review*, 1916, 49-70.

Time and Rhythm. (Review of Recent Literature.) *Psychological Bulletin*, 1916, 206-208.

Tonal Volume and Pitch. *Journal of Experimental Psychology*, 1916, 183.

A Questionary on Psychological Terminology. *The Johns Hopkins Circular*, May, 1916.

K. S. Lashley.

The Color Vision of Birds. 1. The Spectrum of the Domestic Fowl. *Journal of Animal Behavior*, 1916, 1-26.

The Effect of Strychnine upon Habit Formation. *Psychological Bulletin*, 1916, 79-80.

JOHN B. WATSON,

Director of the Psychological Laboratory.

EDUCATION

In accordance with the action of the Trustees of the University, this has been the first year of work in this subject as a separate department.

During the year, the Educational Seminary continued to give its attention to the reports of school surveys and the measurement of educational results which were first taken up in 1914-1915. A critical study of the data contained in the reports of the investigations of the following systems of schools was undertaken: New York (con-

cluded); San Antonio, Texas; South Bend, Indiana; Butte, Montana; Maryland; Orange County, Virginia; and Wisconsin, Normal Schools and the State University. Detailed studies were also reported on vocational surveys and the teaching of English as presented in the survey data.

The course of lectures on Educational Psychology during the past three years concluded this year with the study of higher education, including some of the problems concerning collegiate, university, and professional schools. The historical development of these higher forms of education was utilized in interpreting the present situation, and the successive reforms were examined. Attention was given to various methods of approach to the problems confronted in current practice in higher education.

UNDERGRADUATE COURSES

Undergraduate instruction in education has been conducted in the College Courses for Teachers.

Professor Buchner gave a course on the History of Education and one on the Principles of Education, each meeting two hours a week through the year. In order to meet the needs of social workers, the latter course gave special attention during the second half-year to the social aspects of education and the practical movements designed to develop these features.

Associate Professor C. Macfie Campbell, of the Medical School and the Phipps Psychiatric Clinic, gave a course of ten lectures, accompanied by clinical demonstrations, on the sub-normal child and its training.

The appointment of Miss Florence E. Bamberger (M. A., Columbia University), formerly Supervisor in the Baltimore Schools, as Instructor in Education, will noticeably widen next year the opportunities for the study of educational theory and practice. Her work will lie more particularly in the field of elementary education.

In addition to his regular duties, Professor Buchner continued his visits to Maryland public high schools and to county institutes for teachers. He served during the year as president of the Maryland State Teachers' Association, which held its meeting at Ocean City, June 29th-July 2nd. He also took part in the movement whereby the public schools in this state were being surveyed through the agency of the Maryland Educational Survey Commission and the General Education Board. At the two weeks' annual institute of the teachers of Prince George's County in August and September, he delivered two series of lectures, of ten each, on the history of modern education and on psychology. Addresses in behalf of the efforts to promote the school survey and the consequent legislation, and the interpretation of the new school law were given as follows: "Compulsory School Attendance for Maryland," at Elkton, Elkridge, and also at Annapolis as a part of the annual State Conference for Charities and Correction; "The State Certification of Teachers" (the same conference). Addresses on "The Maryland School Law" were given before the Talbot County Teachers' Association at Easton, the joint institute of the teachers of Charles and St. Mary's counties, and the educational

meeting at Westminster. Commencement addresses were given before the high schools at Annapolis and at Catonsville. On commemoration day he represented the University at the annual gathering of the alumni on the staff of the University of Michigan at Ann Arbor, Michigan.

The Educational Society of Baltimore, now in its tenth year, held its regular monthly meetings, on the second Friday evenings, from October to May, inclusive, in the Donovan Room, McCoy Hall.

PUBLICATIONS

E. F. BUCHNER.

Our Educational Needs. (Presidential address). *Proceedings of the Forty-eighth Annual Meeting of the Maryland State Teachers' Association*, 1915, pp. 18-25.

The Nineteen-Fifteen Summer Courses. *The Johns Hopkins Alumni Magazine*. November, 1915, Vol. iv, pp. 41-44.

The 1915 Summer Courses of the Johns Hopkins University. *Forty-Ninth Annual Report of the State Board of Education of Maryland*, 1915, pp. 138-143.

School Surveys. *Report of the United States Commissioner of Education for the year ended June 30, 1915*. 1915, Vol. I, pp. 433-492.

Report of the Committee appointed to Investigate the Comparative Records made by Students admitted to College on Examination and on Certificate, respectively (In collaboration). *Proceedings of the Twenty-ninth Annual Meeting of the Association of Colleges and Preparatory Schools of the Middle States and Maryland*, 1915, pp. 75-97.

Review of F. W. Roman's "The Industrial and Commercial Schools of the United States and Germany. A Comparative Study." 1915. In *The American Political Science Review*, May, 1916, pp. 379-380.

H. H. MURPHY.

Distribution of Practice Periods in Learning. *Journal of Educational Psychology*, March, 1916. pp. 150-162.

EDWARD F. BUCHNER.

REPORT ON THE WORK OF THE COLLEGE

TO THE PRESIDENT OF THE UNIVERSITY:

I have the honor to submit the following report on the work of the College of Arts and Sciences for the academic year 1915-1916.

Undergraduate instruction was carried on as usual, the courses being given as indicated in the reports of the various departments. The modified curriculum, described in the Report of the President for 1914-1915, was put into effect and found to meet the needs of the students. During the session it was deemed advisable to make certain changes in detail to facilitate the operation of the new plan. The changes approved are as follows:

1. The division of the year into two equal parts, instead of three, the examinations at the end of each half-year's work to be final.
2. A rule requiring instructors to file informal reports upon the work of every student on the 15th of December and on the 25th of March.
3. The requirement that deficiencies in any course be made up by the close of the autumn matriculation examinations following, before the course may count towards graduation.
4. The adoption of a system of probation for students whose work is unsatisfactory.
5. Permission for a student to repeat a required course without obtaining the special consent of the Board of Collegiate Studies.
6. The abandonment of the June entrance examinations and the substitution therefor of the examinations of the College Entrance Examination Board,—which were consequently given in the Academic Building under our oversight.

The Board of Collegiate Studies also passed two measures of the greatest importance to the future of the College.

The first of these was a resolution whereby candidates for the degree of Bachelor of Arts may offer for credit certain courses given by the Peabody Conservatory of Music. It is hoped that this resolution may pave the way for an interchange of credits between the two institutions.

The second measure was a request to the Trustees of the University to establish a course in Military Training, a part of which should count for credit towards graduation. After mature deliberation, the Board of Trustees took favorable action upon this request and authorized the establishment of such a course in accordance with plans laid down by the War College, the details to be subject to the approval of the Academic Council.

Throughout the year efforts were made to develop closer relations between the College and the Schools of the State,—whenever oppor-

tunity offered special visits to the Schools being made by members of the College faculty. In this the State and City Departments of Education afforded the heartiest coöperation and in every case the School was ready to meet us more than half-way.

The extra-curriculum activities of the undergraduates were unusually successful during the year 1915-1916, and there was the consequent increase in college unity which the life at Homewood can but intensify.

MURRAY PEABODY BRUSH,
Acting-Dean of the College Faculty.

REPORT ON THE COLLEGE COURSES FOR TEACHERS

TO THE PRESIDENT OF THE UNIVERSITY:

I have the honor to submit the following report on the work of the College Courses for Teachers, conducted in co-operation with Goucher College, during the academic year, October 11, 1915, to May 27, 1916.

This is the seventh year of these courses, the plans for which are stated in detail in the *University Circular* of May, 1916. Of the courses announced, instruction of standard collegiate grade was given in the following: Chemistry; Education I, II and III; English I, II and III; French I, II and III; German I, II and III; History; Hygiene; Italian; Political Economy I and II; Psychology I, II and III; Spanish. Owing to the small registration, the courses announced in Latin and Mathematics were withdrawn. In response to a special request on the part of the Education and Conservation Committee of the Baltimore Life Underwriters' Association after the opening of the session, a special course of lectures on Life Insurance was arranged. It continued from January 4 to the end of the academic year. The large registration in this course indicated that it was meeting an important need in the business life of our community. These courses were conducted by twenty-three Instructors, three of whom were members of the staff of Goucher College, the remainder of the University.

The program of courses begun in the year 1913-14 to meet the needs of persons engaged in social work and of those in training for this work was continued and expanded by the addition of a course on social problems, a course on social psychology, and a half-year course on the social aspects of education. The continued response to these special lines of study indicates that this new field of service, upon which the University has entered, is capable of still further development.

The enrollment in the courses was three hundred twenty-six the first half-year, and two hundred eighty-eight the second half-year, the total enrolment for the year being three hundred forty-three. Forty-seven of these were duplicate registrations from other divisions of the University, as follows: Twenty-six graduate, four medical, nine academic and eight engineering. The primary registration of the year in the College Courses for Teachers was two hundred ninety-eight, an increase of one hundred sixteen over the preceding year. Ninety-nine were men, and two hundred forty-four were women. Of the one hundred eighty-nine students registered in the courses last year, sixty-nine continued their registration this year. There were twenty graduate students among those primarily registering in these courses. The amount of work accomplished is best indicated by the following figures: Three students registered in four courses, three in three courses, forty-six in two courses and two hundred ninety-

one in one course, each. It is gratifying to note the increased amount of time which students, in these courses, are giving to their work.

The occupational distribution of the persons registered is extremely interesting and indicates the widening range of professional and commercial interests in our community which the University is serving: Teachers and those in preparation for teaching, one hundred thirty-five; no occupation, fifty-four; students, fifty-two; life insurance agents, forty; social workers and nurses, thirty-five; secretaries, etc., ten; librarians, three; lawyers, two; a single representative of each of the following: agent of the United States Department of Agriculture, author, bookkeeper, clergyman, superintendent of a railway system, manufacturer, broker, merchant, salesman, engineer of the State Board of Health, superintendent of hospital.

The annual conference of the presidents and deans of the two institutions, with the instructors in these courses, was held on May 20, 1916. The report made by the latter on the character and scope of the work done by their students indicated that it continued, as during the six years past, to maintain the standards required in the regular collegiate classes in the two institutions. The following amounts of credits for the courses were recommended and authorized: Chemistry, six points; Education I, six points; Education II, six points; Education III, one and a half points; English I, six points (for a grade of eight or more), four points (for a grade of six or less than eight); English II, four points; English III, six points; French I, eight points; French II, six points; French III, six points (a grade of eight or more) three points (grade of six or less than eight); German I, eight points (grade of eight or more), six points (grade of six or less than eight); German II, eight points; German III, six points; History, six points; Hygiene, six points; Italian, six points; Life Insurance, four points; Political Economy I, six points; Political Economy II, six points; Psychology I, six points (for a maximum amount of work), four points (for a minimum amount of work); Psychology II, six points; Psychology III, six points (for a maximum amount of work), four points (for a minimum amount of work); Spanish, six points. It was voted that all credits recommended be made a matter of permanent record in the office of the Registrar, as heretofore.

Two important events occurring during the year should be mentioned. At the beginning of the session, the Board of Trustees of the University adopted a regulation, which provided that students enrolled in the graduate and medical schools and in the academic and engineering departments and paying full tuition, or receiving scholarship benefits, should be permitted to enroll in any of these courses without payment of additional tuition fees. This action immediately increased the number of courses from which students could make elections meeting the needs of their individual programs. The number of duplicate registrations reported above indicates the extent of the university facilities thus enjoyed by students. This action also enabled the College Courses for Teachers to be of special assistance in building up some of the departments of graduate instruction by enabling advanced students, particularly women, to secure the necessary elementary instruction prerequisite to the advanced courses. This assistance occurred this year in the departments of Italian and Spanish.

As a mark of academic recognition for the accomplishments of students in this division of University work, the Trustees established the degree of Bachelor of Science. The regulations controlling this degree having been worked out during the year by the Advisory Committee placed in charge thereof, the degree was conferred upon three candidates at the close of the session. The University is now able to provide definitely for the academic welfare of a specific group of students which has been in attendance since 1909.

In view of the increasing usefulness of the work undertaken by the students and the enlarging fields of community service, the Committee has elaborated a larger program of these courses for the year 1916-17.

EDWARD F. BUCHNER,

Director.

REPORT OF THE DIRECTOR OF THE SUMMER COURSES

TO THE PRESIDENT OF THE UNIVERSITY:

I have the honor to present the following report of the sixth session of the Summer Courses of the University, which was held during the six weeks from July 5 to August 15, 1916.

As was the case in former sessions, the University enjoyed a wide range of co-operation with other agencies in the preparation and perfection of the plans for the session. The recent survey of public education in Maryland, and the legislation consequent thereupon, resulted in a more marked definition of some of the fields of educational work in which the University should engage in order to yield the largest returns to those teachers of the State of Maryland who might look to the University for assistance in meeting the new legal requirements. Accordingly, the assistance of state, city, and county superintendents was given in the selection of proper material of instruction. The Alliance of Social and Charitable Agencies materially assisted in the organization and maintenance of a course especially designed for the training of school attendance officers, to the end that a central feature of the new Maryland School Law should be put effectively into operation during the coming year. The Carnegie Foundation for International Peace again placed this University upon its list of institutions in whose summer sessions it maintained, by gift, courses in history, international law and Spanish in their relation to American and international affairs. The Children's Playground Association of Baltimore, Incorporated, continued its co-operation in the maintenance of a course for the training of leaders in playground activities. The Board of School Commissioners of Baltimore continued its helpful co-operation, which has been a feature of the summer work since the beginning, by making possible the continuance of instruction in domestic science and art and manual training and the addition of a 6 A Grade class of pupils for demonstration purposes in connection with the course on Elementary School Supervision. The A. N. Palmer Company, of New York, generously provided instruction in penmanship. The Peabody Conservatory, through its summer session, continued its extended co-operation as in former years. The rural demonstration school was indebted to the Dulany-Vernay Company for the use of furniture.

The scope of the instruction offered included a total of seventy-nine courses in the twenty-one subjects listed below. Political Economy, Geography, and Penmanship were the subjects offered for the first time. In accordance with a well established practice, the material arranged in the different subjects given in former years was so selected that the majority of the courses actually offered new subject matter. Of the courses announced, Economics 2 and Mathematics 2 and 4 were not given. In response to special demands, unannounced

courses in plant taxonomy, elementary school supervision, training school attendance officers, and penmanship were arranged at the opening of the session.

The persons appointed to give instruction were as follows:

<i>Biology</i>	2 courses.
Howard E. Enders, Instructor in Summer Courses.	
<i>Chemistry</i>	6 courses.
J. Elliott Gilpin, Professor.	
Benjamin F. Lovelace, Associate Professor.	
Oregon B. Helfrich, Laboratory Assistant.	
<i>Domestic Art</i>	2 courses.
Edna I. Avery, Instructor in Summer Courses.	
<i>Domestic Science</i>	3 courses.
Greta Gray, Instructor in Summer Courses.	
<i>Economics</i>	3 courses.
Nathaniel R. Whitney, Instructor.	
<i>Education</i>	15 courses.
Bird T. Baldwin, Instructor in Summer Courses.	
Anna Brochhausen, Instructor in Summer Courses.	
Clarence G. Cooper, Instructor in Summer Courses.	
William J. Holloway, Instructor in Summer Courses.	
Edith A. Lathrop, Instructor in Summer Courses.	
Abby P. Leland, Instructor in Summer Courses.	
Willard S. Small, Instructor in Summer Courses.	
Matilda Srager, Instructor in Summer Courses.	
Alda L. Armstrong, Instructor in Summer Courses.	
Theo Jacobs, Instructor in Summer Courses.	
George L. Jones, Instructor in Summer Courses.	
<i>English Composition</i>	4 courses.
Robert M. Gay, Instructor in Summer Courses.	
Willis H. Wilcox, Instructor in Summer Courses.	
<i>English Literature</i>	4 courses.
Robert M. Gay, Instructor in Summer Courses.	
Alfred A. Kern, Instructor in Summer Courses.	
<i>French</i>	3 courses.
Gustav Gruenbaum, Instructor.	
<i>Geography</i>	1 course.
David G. Thompson, Instructor in Summer Courses.	
<i>German</i>	5 courses.
Robert B. Roulston, Associate.	
Henry Wood, Professor.	
<i>History</i>	5 courses.
Robert T. Crane, Instructor in Summer Courses.	
Herbert C. Lipscomb, Instructor in Summer Courses.	
William Starr Myers, Instructor in Summer Courses.	
<i>Latin</i>	2 courses.
Herbert C. Lipscomb, Instructor in Summer Courses.	

<i>Manual Training</i>	3 courses.
George M. Gaither, Instructor in Summer Courses.	
<i>Mathematics</i>	4 courses.
Arthur B. Coble, Associate Professor.	
<i>Penmanship</i>	4 courses.
Jack London, Instructor in Summer Courses.	
<i>Physics</i>	5 courses.
Joseph S. Ames, Professor.	
A. Herman Pfund, Associate Professor.	
<i>Playground and Recreation</i>	1 course.
Mary E. Gross, Instructor in Summer Courses.	
<i>Politics</i>	2 courses.
Robert T. Crane, Instructor in Summer Courses.	
<i>Psychology</i>	3 courses.
Knight Dunlap, Associate Professor.	
<i>Spanish</i>	2 courses.
Frederick C. Tarr, Instructor in Summer Courses.	

Ten of the instructors and assistants were members of the University. To these were added the following representatives of other institutions and school systems: Miss Edna I. Avery, Instructor in Home Economics, of the New York State College for Teachers; Professor Bird T. Baldwin, of Swarthmore College; Principal Anna Brochhausen, of the Indianapolis Public Schools; Mr. Clarence G. Cooper, Supervisor of Rural Schools of Baltimore County, Maryland; Assistant Professor Robert T. Crane, of the University of Michigan; Associate Professor Howard E. Enders, of Purdue University; Mr. George M. Gaither, Instructor and Supervisor in the Baltimore Public Schools; Professor Robert M. Gay, of Goucher College; Miss Greta Gray, Instructor in Household Science, of the University of Illinois; Miss Mary E. Gross, Supervisor of the Children's Playground Association of Baltimore; Dr. Gustav Gruenbaum, formerly Instructor in Romance Languages, of New York City; Superintendent William J. Holloway, of Wicomico County, Maryland; Professor Alfred A. Kern, of Millsaps College; Assistant Superintendent Edith Anne Lathrop, of Nebraska; Principal Abby P. Leland, of the New York Public Schools; Professor Herbert C. Lipscomb, of Randolph-Macon Woman's College; Mr. Jack London, formerly of the State Normal School of Edmund, Oklahoma; Assistant Professor William Starr Myers, of Princeton University; Principal Willard S. Small, of the Eastern High School, Washington, D. C.; Miss Matilda Srago, of the New York City Schools; Mr. Frederick C. Tarr, Instructor in Spanish, Mt. St. Agnes College; Mr. David G. Thompson, Instructor in Geology, of Goucher College; Professor Willis H. Wilcox, of the Maryland State Normal School; Mr. George L. Jones and Miss Alda L. Armstrong, of the Maryland Children's Aid Society, and Miss Theo Jacobs, of the Federated Charities of Baltimore. It is a pleasure to be able to report that the unusual success of the session was due, in large measure, to the unstinted energy and generous enthusiasm with which the members of the staff conducted their work.

The enrolment numbered five hundred ninety-five. Of these, one hundred sixty-three, or over 27 per cent., were men, and four hundred thirty-two, or over 72 per cent., were women. The total number of course registrations was one thousand three hundred fifty-two, the average number of courses taken per student being 2.27. The distribution of these elections was as follows: One course was taken by ninety-six students; two courses, by one hundred seventy-four; three courses, by two hundred eighty-eight, and four courses, by thirty-seven, each. Four hundred sixty-six, or 78.3 per cent., of the students were administrative and supervisory officers or teachers in state and county systems, colleges, normal schools, public and private schools. Fifty-nine, or 9.9 per cent., were students in colleges. Thirty-nine, or 6.8 per cent., represented seventeen other occupations, and thirty-one, or 6 per cent., were engaged in no occupation. One hundred thirty-two, or 22 per cent., held academic or professional degrees from seventy-two institutions. The geographical distribution of the students was as follows: Maryland was represented by five hundred fourteen students, of whom three hundred seventy-nine, or 63.7 per cent., were from the counties, and one hundred thirty-five, or 22.7 per cent., from Baltimore City; nineteen other states and the District of Columbia, by eighty-one, or 13.6 per cent. This was the second year that each of the twenty-three counties of Maryland was represented among the student body.

This was the second year of the inclusion of graduate work in the summer program. Under the regulation of the Board of University Studies, this work receives proper recognition when offered by candidates for the degree of Master of Arts. The registration of one hundred ten graduate students was a notable increase over the registration in 1915. Nearly one-third of these students made formal application for admission as graduate students. It is apparent that the hope of having the summer work thus strengthen the advanced work in the regular session will be realized. One hundred forty-six, or nearly 25 per cent., of all the students enrolled in the session pursued graduate courses. Under the new Maryland educational law, which went into effect June 1, 1916, the University, by means of the summer course, is in the fortunate position of being able to meet the needs of various types of school officers and teachers who will in the future be required to give evidence of having successfully pursued university work in order to enable them to meet the legal requirements for their respective certificates.

A distinctive feature of the session was the work of the course introduced for the special training of the newly created Maryland school attendance officers to meet the needs of the compulsory school attendance law of the State, which goes into effect during the coming school year. The course was given through the co-operative activities of the Alliance of Social and Charitable Agencies, the Maryland Children's Aid Society, and the Federated Charities of Baltimore, with the generous aid of a number of lecturers and assistants, as recorded in the Directory of Summer Courses (*University Circular*, July, 1916). They conducted a piece of pioneer instruction and training, which combined educational and social ends. Very material assistance will thus be given to officials, teachers and parents in the counties of Maryland, in putting the new school attendance requirement into effect.

Subjects and Courses	Points Credit.	Enrol- ment.	Number taking Examina- tions.
Biology			
Botany	4	13	8
Zoology	4	10	9
Plant Taxonomy (Special).....	3	1	
Chemistry			
Organic Chemistry.....	Grad.	7	3
Advanced Inorganic Chemistry.....	Grad.	9	7
Inorganic Reactions and Inorganic Pre- parations	Grad.	3	2
Quantitative Analysis.....	Grad.	4	4
Household and Textile Chemistry.....	3	5	3
Introduction to General Chemistry.....	3	22	15
Domestic Art			
Textiles and Clothing.....	3	3	2
Elementary Clothing	3	2	2
Domestic Science			
Advanced Cookery.....	3	4	3
Elementary Cookery.....	3	9	8
Methods of Teaching Domestic Science..	2	8	7
Economics			
The Money Market and the European War Taxation and Social Reform.....	Grad. 3	5 7	3 6
Education			
The Administration of Secondary Educa- tion	Grad.	34	23
Experimental Education.....	Grad.	31	23
Secondary School Teaching.....	Grad.	31	27
Educational Psychology.....	Grad.	41	29
Elementary School Supervision.....	Grad.	10	6
The Elementary School: Grammar Grades	3	51	30
The Elementary School: Primary Grades	3	34	66
The Teaching of English in the Ele- mentary School.....	3	77	71
The Teaching of Arithmetic and History in the Elementary School.....	3	48	28
Supervision of Rural Schools.....	2	11	10
Rural School: Methods Course.....	3	51	48
A Demonstration School: Observation Course	2	56	54
The Principles of Elementary Teaching..		70	66
School Management and School Law....		68	66
School Attendance Officers.....		33	25
English Composition			
Description and Narration.....	3	28	24
Theme-Writing	3	34	26
Elements of English Composition.....		20	18
English Grammar.....		28	23
English Literature			
Tennyson: <i>Idylls of the King</i>	Grad.	25	21
Shakespeare: Tragedies	Grad.	29	19
History of the English Language.....	Grad.	7	7
The History of English Literature, 1600- 1775	3	18	11

Subjects and Courses	Points Credit	Enrol- ment	Number taking Examina- tions
<i>French</i>			
The French Theater in the Seventeenth Century	3	3	3
Readings in French	3	7	6
Elementary French	3	14	7
<i>Geography</i>			
Physical and Economic Geography.....	2	32	32
<i>German</i>			
Swabian and Austrian Poets in the First Half of the Nineteenth Century.....	Grad.	6	6
Two Epochs of Reform in German Language and Style.....	Grad.	2	2
Advanced German.....	Grad.	5	4
Readings in German.....	2	14	12
Elementary German.....		25	20
<i>History</i>			
Pan-American Relations.....	Grad.	7	6
American History, 1848-1877.....	Grad.	28	27
American History to 1788.....	3	24	23
European History since 1815.....	3	17	16
Greek History.....	3	11	7
<i>Latin</i>			
Livy: Books XXI-XXII.....	3	1	1
Virgil: Aeneid I-VI.....	2	5	3
<i>Manual Training</i>			
Bench Work in Wood and Mechanical Drawing	3	4	4
Elementary Manual Training.....	3	28	28
<i>Mathematics</i>			
Higher Algebra.....	Grad.	3	2
Analytic Geometry.....	4	9	5
<i>Penmanship</i>		84	64
<i>Physics</i>			
Selected Topics in the Mathematical Theory of Electricity.....	Grad.	4	3
Radioactivity	Grad.	1	1
Wave-Motions: Sound and Light.....	4	7	5
Electricity and Magnetism.....	4	9	7
Teachers' Course in General Physics....	2	5	1
<i>Playground and Recreation</i>			
Singing Games, Folk Dances, and Athletic Games.....		13	13
<i>Politics</i>			
International Law.....	Grad.	5	4
Municipal Government.....	3	8	7
<i>Psychology</i>			
Experimental Psychology.....	Grad.	3	2
The Affective Processes.....	Grad.	11	10
Introduction to General Psychology....	3	46	40
<i>Spanish</i>			
Readings in Spanish.....	3	6	6
Elementary Spanish.....	3	16	12

The preceding table presents a survey of the work done by the students in so far as this may be gathered from a list of the courses given in the several subjects, the courses allowed academic credit, the enrolment in each, and the number taking examinations at the close of the session.

During the progress of the session, it was most gratifying to note an unusual increase in the earnestness of the student body. The high standard of effort and attainment which had become traditional in former sessions was, if possible, exceeded this year. Ninety-eight per cent. were entitled to certificates of attendance or examination; and 96.1 remained to complete their work by taking the examinations at the close.

The series of Friday evening lectures and entertainments of a more popular character, and Sunday afternoon organ recitals, open to the public, were made especially attractive through the cordial co-operation of the summer session of the Peabody Conservatory of Music. The series included public recitals in the concert hall of the Conservatory, and lectures, each preceded by a special musical program under the direction of Mr. Frederick R. Huber, Director of the Peabody Summer School, in McCoy Hall. The programs were as follows:

- July 7—Miss Eleanor Chase, soprano, of the Conservatory.
Recital.
- July 9—Mr. Howard G. Thatcher.
Organ Recital.
- July 14—Dr. William Starr Myers, of Princeton University.
"The Education of Abraham Lincoln."
- July 16—Mr. Harold D. Phillips, F. R. C. O., organist of the Conservatory.
Recital.
- July 21—Mr. George F. Boyle, pianist, and Mr. J. C. Van Hulsteyn, violinist, of the Conservatory.
Recital.
- July 23—Organ Recital.
- July 28—Professor Joseph S. Ames, of the University.
"The Physical Basis of Music."
- July 30—Organ Recital.
- August 4—Mr. Harold D. Phillips, organist, and Mr. Bart Wirtz, cellist, of the Conservatory.
Recital.
- August 6—Organ Recital.
- August 11—Dr. Robert T. Crane, of the University of Michigan.
"Pan Americanism and the Three Americas."

An especially interesting series of lectures on "The History of Music" was given by Mr. Otto Ortmann on Monday and Thursday afternoons at the Conservatory. The topics in this series were:

- July 3—Antiquity.
July 6—The Early Christian Age.
July 10—Epoch of Vocal Counterpoint.

July 13—Development of Monophony.

July 17—The Classic School (Bach, Handel and Gluck).

July 20—The Perfection of Form.

July 24—The Transition to the Romantic School.

July 27—Development in the 19th Century.

July 31—Opera in the 19th Century.

August 3—Nationalistic Tendencies.

August 7—Music of the Present Day.

August 10—Resumé.

The social welfare of the members of the faculty and student body received attention. The directors gave a reception to the two faculties at the Johns Hopkins Club on Wednesday evening, July 5th. Opening and closing receptions by the University and Conservatory were given to the faculties and students on Friday evenings, July 7th and August 11th. One was given in the Peabody Art Gallery, and the other in McCoy Hall. A lawn party was held at Homewood on the afternoon of Saturday, July 15th. Saturday excursions were taken to Annapolis on July 22nd, on invitation of Dr. M. Bates Stephens, State Superintendent of Schools, and to Washington, D. C., on July 20th, on invitation of Dr. P. P. Claxton, United States Commissioner of Education.

EDWARD F. BUCHNER,

Director.

REPORT OF THE DEAN OF THE MEDICAL FACULTY

TO THE PRESIDENT OF THE UNIVERSITY:

I have the honor to submit the following report of the activities of the Medical Department during the year extending from October 1, 1915, to September 30, 1916.

The total enrollment of candidates for the degree of doctor of medicine was 358. Five students withdrew for various causes, reducing the enrollment at the end of the academic year to 353.

Upon the recommendation of the Advisory Board of the Medical Faculty, the University conferred the degree of Doctor of Medicine upon one student on February 22, 1916, and upon 81 students at the Commencement exercises held June 13, 1916.

Twenty-five physicians registered for special instruction in various branches of medicine and surgery during the school year, and 59 physicians were enrolled for the summer courses offered to graduates in medicine during the six months beginning June 1, 1916.

Three hundred and ninety-two persons made inquiry concerning admission to the 1916-17 session, 187 filed formal applications and of them ninety-one were accepted for the first year and eighteen for advanced standing. Five students were admitted with conditions: two in French, two in German and one in Latin.

All of the regular courses announced in the catalogue have been given.

The ninth course of lectures upon the Herter Foundation was given by Dr. Theobald Smith, Director, Department of Animal Pathology, the Rockefeller Institute for Medical Research, on May 11th, 12th, and 15th, 1916. Their titles were: "Aberrant Parasitism in its Bearing upon Disease," "Adaptation of Parasites to the Natural Defense of the Host," and "Immunity and Parasitism."

The health of the student-body during the past year has been very satisfactory. Careful physical examination was made of the incoming students, seven of whom were found to be in need of special supervision, but none was seriously sick. During the coming year the scope of these examinations will be extended with the idea of giving the health of the students still closer supervision.

With the beginning of the present session the New Hunterian Laboratory was opened. This affords abundant facilities for the care of experimental animals and for certain research work in the departments of Medicine, Pediatrics, and Pathology. The building also houses the Medical School Library and the department of Art in Medicine, and one floor is rented to the Embryological Department of the Carnegie Institution of Washington, under the supervision of Professor Mall.

The Library is now in fire-proof quarters instead of in the inflammable Physiological Building. These accommodations, however, must be looked upon as temporary, as the number of books is

increasing so rapidly that the new accommodations will suffice only for a few years. This brings up the necessity for a suitable library building, which will house not only the Medical School but also the Hospital collections, and affords a home for the department covering the History of Medicine. Steps have already been taken to arouse interest in the matter and to procure funds for the erection of the building and its endowment.

In consequence of the removal of the Library, additional room has been set free for the department of Physiology. In this connection I would call attention to the fact that the departments of Pharmacology and Physiological Chemistry are inadequately housed and are in urgent need of expansion.

The "full-time" scheme in the departments of Medicine, Surgery and Pediatrics has proved a great success and has demonstrated the wisdom of those who urged and made it possible. It is earnestly hoped that in the near future funds may become available to place the remaining main clinical departments upon a similar basis.

While the work in the "full-time" clinical departments is reasonably well provided for, I desire to call attention to the relatively poor provision for several of the departments covering the underlying medical sciences, and to the fact that the time is rapidly approaching when considerable expansion will become imperative and that funds for this purpose are urgently needed.

I would call attention to the following gifts made to the Medical School during the year:

Dr. Alma E. Beale, of the Class of 1900, her medical library, together with that of her father.

Dr. Joseph H. Hewitt, of the Class of 1906, his library and certain shares of bank stock, to form a nucleus for a departmental library of Pathology.

Through Dr. Janeway, Mr. Percy Pyne, of New York, and Mr. Charles L. Taylor, of Pittsburgh, contributed \$500. and \$100. respectively towards the purchase of new electrocardiographic apparatus.

Mr. Kenneth Dows gave a considerable sum of money to the Hospital and University for work in tuberculosis. This gift makes possible a large extension of the work in that department, and affords greatly increased opportunities for research work to the instructors and students in the Medical School.

I regret to report that five of our alumni died during the year, viz., Alma E. Beale (1900), August 31, 1915; James G. Fergusson (1914), July 14, 1916; Joseph H. Hewitt (1906), January 10, 1916; William R. Hudson (1911), July 23, 1916; Merle C. Newkirk (1913).

During the year the following members of the teaching staff resigned:

Dr. Leonard G. Rowntree, Associate Professor of Medicine, to become Professor of Medicine, University of Minnesota.

Dr. William C. Quinby, Associate in Urology, to become Urologist-in-Chief, Peter Bent Brigham Hospital, Boston.

Dr. George Walker, Associate in Clinical Surgery.

Dr. Cecil K. Drinker, Instructor in Physiology, to become Instructor in Physiology, Harvard Medical School.

Dr. Veader N. Leonard, Instructor in Gynecology.

- Dr. D. Sclater Lewis, Instructor in Medicine.
- Dr. Roy D. McClure, Instructor in Surgery, to become Surgeon-in-chief, Henry Ford Hospital, Detroit, Mich.
- Dr. William L. Milles, Instructor in Obstetrics, to become Medical Adviser, Consolidated Gas, Electric Light and Power Company of Baltimore.
- Dr. George Peirce, Instructor in Urology, to become Chemist, Colgate Company, New York.
- Dr. Calvin H. Goddard, Assistant in Medicine.
- Dr. Lewie M. Griffith, Assistant in Clinical Laryngology.
- Dr. Franklin Hazlehurst, Assistant in Clinical Laryngology.
- Dr. H. Page Mauck, Assistant in Surgery.
- Dr. Henry R. Muller, Assistant in Anatomy.
- Dr. Alice Rohde, Assistant in Pharmacology, to become Instructor in Experimental Medicine, University of California.
- Dr. Alma S. Rothholz, Assistant in Laryngology.
- Dr. F. Janney Smith, Assistant in Medicine, to become Resident Physician, Henry Ford Hospital, Detroit, Mich.
- Dr. David C. Streett, Assistant in Medicine.

The following new appointments and promotions were made

University Staff

- Dr. Allen K. Krause, Associate Professor of Medicine.
- Dr. Charles A. Rouiller, Associate in Pharmacology.
- Dr. Stanhope Bayne-Jones, Instructor in Pathology.
- Dr. John A. C. Colston, Instructor in Urology.
- Dr. Ernest A. Grey, Instructor in Surgery.
- Dr. Daniel Davis, Instructor in Obstetrics.
- Dr. Grover F. Powers, Instructor in Pediatrics.
- Dr. H. Hays Bullard, Assistant in Pathology.
- Dr. Carl Binger, Assistant in Pharmacology.
- Dr. Jonathan E. Burns, Jr., Assistant in Urology.
- Dr. James J. Chisolm, Assistant in Laryngology.
- Dr. Samuel W. Clausen, Assistant in Medicine.
- Dr. Stanley Cobb, Assistant in Physiology and Psychiatry.
- Dr. DuMont F. Elmendorf, Assistant in Orthopedic Surgery.
- Dr. Frank A. Evans, Assistant in Medicine.
- Dr. Lloyd D. Felton, Assistant in Pathology.
- Dr. Raymond S. Hussey, Assistant in Pathology.
- Dr. Joseph S. Lawrence, Assistant in Bacteriology and Hygiene.
- Dr. Linda B. Lange, Assistant in Medicine.
- Dr. Charles L. McCarthy, Assistant in Laryngology.
- Dr. John G. Murray, Jr., Assistant in Obstetrics.
- Dr. Clarence A. Naymann, Assistant in Psychiatry.
- Dr. Henry B. Richardson, Assistant in Medicine.
- Dr. Virgil P. W. Sydenstricker, Assistant in Medicine.
- Dr. George B. Wislocki, Assistant in Anatomy.
- Dr. N. Worth Brown, Voluntary Assistant in Medicine.
- Dr. Horace Gray, Voluntary Assistant in Medicine.

Clinical Staff

- Dr. Harry L. Homer, Instructor in Clinical Surgery.
- Dr. Edward V. Coolahan, Assistant in Clinical Medicine.
- Dr. Hoagland C. Davis, Assistant in Clinical Laryngology.

Dr. Hiram Fried, Assistant in Clinical Medicine.
 Dr. Joseph E. Gately, Assistant in Clinical Dermatology.
 Dr. Isidore I. Hirschman, Assistant in Clinical Medicine.
 Dr. M. Randolph Kahn, Assistant in Clinical Ophthalmology.
 Dr. John T. King, Jr., Assistant in Clinical Medicine.
 Dr. John W. Pearson, Assistant in Clinical Roentgenology.
 Dr. George L. Stickney, Voluntary Assistant in Clinical Gynecology.

The Maryland, Virginia and North Carolina scholarships for 1915-16 were awarded as follows:

Maryland: E. Novak.

Virginia: W. P. Jackson, J. H. Kite, A. S. McCown, W. B. Martin.

North Carolina: H. B. Conrad.

The Joseph Kernochan Garr Scholarship was awarded to Miss Margaret Tyler.

The twenty-two members of the graduating class mentioned below were recommended to the Trustees of the Johns Hopkins Hospital for appointment as House Officers, and are now serving in that capacity:

Dr. I. C. Barclay	Dr. C. L. McCarthy
Dr. H. C. Bean	Dr. P. F. McGuire
Dr. H. B. Conrad	Dr. M. K. Miller
Dr. J. P. Eidson	Dr. J. E. Moore
Dr. J. A. Etheridge	Dr. S. O. Reese
Dr. R. E. Fairbank	Dr. H. W. Reid
Dr. J. W. Harris	Dr. F. E. Roberts
Dr. G. A. Harrop	Dr. C. E. Sevier
Dr. I. K. Lovett	Dr. D. G. Smith
Dr. W. B. Martin	Dr. A. C. Sutton
Dr. L. K. McCafferty	Dr. T. L. Sutton

The positions obtained by other members of the Class, either by competitive examination or by personal appointment, are as follows:

W. W. Anderson.—Interne, City Hospital, Bay View.
 H. S. Applebaum.—Interne, Mt. Sinai Hospital, Cleveland, O.
 E. P. Bacon.—Interne, Philadelphia General Hospital, Philadelphia, Pa.
 P. Blanco.—Interne, University Hospital, Minneapolis, Minn.
 S. Brock.—Interne, Lakeside Hospital, Cleveland, O.
 H. H. Bullard.—Assistant in Pathology.
 H. J. Burkholder.—Interne, Hartford Hospital, Hartford, Conn.
 J. J. Carden, Jr.—Interne, Bridgeport City Hospital, Conn.
 P. W. Christman.—Interne, City Hospital, Bay View.
 S. G. Clark.—Interne, Methodist Episcopal Hospital, Brooklyn, N. Y.
 W. W. Cummings.—Interne, Rhode Island General Hospital, Providence, R. I.
 F. I. Darrow.—Interne, Barnes Hospital, St. Louis, Mo.
 H. B. Disbrow.—Interne, Jefferson Surgical Hospital, Roanoke, Va.
 R. J. Erickson.—Interne, Royal Victoria Hospital, Montreal, Can.
 L. D. Felton.—Assistant in Bacteriology and Serology.
 R. L. Fielder.—Interne, So. Pacific Hospital, San Francisco, Cal.
 W. P. Finney, Jr.—Rockefeller Fellow in Pathology.
 R. G. Fuller.—Interne, H. A. Kelly Hospital, Baltimore.
 H. C. F. Gill.—Interne, Union Protestant Infirmary.

- A. B. Greenwood.—Interne Highamith Hospital, Fayetteville, N. C.
W. E. Grempler.—Interne, Hospital of Univ. of Minnesota, Minneapolis, Minn.
F. H. Haessler.—Interne, Henry Ford Hospital, Detroit, Mich.
D. H. Hallock.—Interne, New York Hospital, N. Y.
H. H. Hamman.—Interne, West Penn Hospital, Pittsburgh, Pa.
M. I. Handy.—Interne, Woman's Hospital, Philadelphia, Pa.
C. M. Harmon.—Interne, Church Home and Infirmary, Baltimore.
T. J. Heldt.—Interne, Psychiatric Institute, Ward's Island, N. Y.
F. K. Herpel.—Interne, Hartford Hospital, Hartford, Conn.
E. M. Hicks, Jr.—Interne, Jefferson Surgical Hospital, Roanoke, Va.
R. C. Hood.—Interne, Post Graduate Hospital, New York.
J. M. Hundley.—Interne, Union Protestant Infirmary, Baltimore.
M. Jenks.—Interne, Infirmary for Women and Children, New York, N. Y.
A. L. Kinne.—Interne, City Hospital, Boston, Mass.
J. S. Lawrence.—Assistant in Bacteriology and Hygiene.
H. F. Lena.—Interne, City Hospital, Boston, Mass.
A. L. Lincoln.—Interne, Post Graduate Hospital, New York, N. Y.
J. G. Long.—Interne, St. Agnes' Hospital, Baltimore.
E. H. Maas.—Interne, Bellevue Hospital, New York, N. Y.
R. S. Major.—Assistant Director, State Board of Health, Greenville, S. C.
W. T. Mitchell, Jr.—Interne, Allegheny General Hospital, Pittsburgh, Pa.
J. H. Mullin.—Interne, Methodist Episcopal Hospital, Philadelphia.
D. R. Murchison.—Interne, Henry Ford Hospital, Detroit, Mich.
A. J. Pfitsch.—Interne, St. Agnes Hospital, Baltimore.
C. B. Pritchett.—Interne, St. Agnes Hospital, Baltimore.
F. D. Reynolds.—Interne, St. Francis Hospital, Pittsburgh, Pa.
L. Reynolds.—Assistant in X-Ray Department, J. H. H.
T. B. Smith.—Interne, University of Minn. Hospital, Minneapolis.
W. W. Southard.—Interne, U. S. Soldiers Home Hospital, Washington, D. C.
J. S. Speed.—Interne, Jefferson Surgical Hospital, Roanoke, Va.
R. E. Stifel.—Interne, Lakeside Hospital, Cleveland, O.
J. K. Stoddard.—Interne, Mass. General Hospital, Boston, Mass.
H. M. Thomas, Jr.—Interne, Mass. General Hospital, Boston, Mass.
A. A. White.—Interne, U. S. Soldiers Home Hospital, Washington, D. C.
G. B. Wislocki.—Assistant in Anatomy.
E. L. Zimmerman.—Interne, City Hospital, Boston, Mass.

J. WHITRIDGE WILLIAMS,
Dean.

REPORT OF THE DEPARTMENT OF ENGINEERING

TO THE PRESIDENT OF THE UNIVERSITY:

We beg to hand you herewith the third annual report of the Department of Engineering, for the year ending June 30, 1916:

The total enrollment of students at the opening of the year was 148. Of these 19 were graduates of other institutions, 4 were special students, 142 were candidates for the degree of Bachelor of Science in Engineering, and 2 were candidates for higher degrees. There have been 3 withdrawals, reducing the enrollment at the end of the academic year to 145.

Upon the recommendation of the Advisory Committee of the Department of Engineering and the Board of University Studies, the degree of Bachelor of Science in Engineering was conferred upon 12 students and the degree of Doctor of Philosophy upon 1 student in the Department of Engineering at the Commencement exercises held June 13, 1916.

The total number of scholarships awarded to students in Engineering during the year was 97. Most of these were regular scholarships provided under the Legislative Act, establishing scholarships in the Department of Engineering. A complete list of holders of scholarships of the several types is given at the end of this report.

On October 14, 1915, ground was broken for the new building to be devoted to the Department of Civil Engineering. Work on this building has progressed somewhat slowly, owing largely to the unusual amount of rainy weather through the winter and spring. It will almost certainly not be finished within the contract time (Aug. 15, 1916) but every effort is being made to push the work, and it is hoped that part of the building, at least, will be available when the University opens next Fall.

We regret to report the resignation of Mr. John H. Billings, as Instructor in Mechanical Engineering. Mr. Billings leaves us to accept a more advanced position in the University of Toronto.

Following is a statement of the activities and courses given in each of the branches of Engineering:

CIVIL ENGINEERING

Advanced Course

Advanced Sanitary Engineering. *Four hours weekly during the second half-year.* Mr. Jones.

Undergraduate Courses

Civil Engineering 1. Theory of the Strength of Materials and Elements of Structural Design. *Three lectures or recitation hours,*

and four hours of drafting room or laboratory work weekly through the first half-year. Professor Tilden and Mr. Weaver.

Civil Engineering 1b. (Continuation of course 1). *Two lectures or recitation hours, and four hours of drafting room or laboratory work weekly through the second half-year.* Professor Tilden and Mr. Weaver.

Civil Engineering 1c. Elementary Principles of Hydraulics. *Two lecture or recitation hours* (or, at the the option of the instructor, *one lecture hour and three hours in the laboratory*) *weekly through the second half-year.* Mr. Jones and Mr. Weaver.

Civil Engineering 2. Theory of Structure and Design. *Three lecture or recitation hours, and six hours of drafting room or field work, weekly through the year.* Professor Tilden and Mr. Weaver.

Civil Engineering 3. Elements of Sanitary Engineering. *Three lectures or recitation hours and six hours of drafting-room or laboratory work weekly through the year.* Mr. Jones.

Civil Engineering 4. Transportation (Elective). *Two lecture or recitation hours, and three hours in drafting-room or field, weekly, through the year.* Professor Tilden (Railways and Canals). Mr. Jones (Highways).

Engineering Drawing. Lettering, Orthographic and Isometric Projection. *Four hours in the drafting room, weekly, through the first half-year.* Mr. Jones and Mr. Weaver.

Surveying. The work in theory and practice of surveying, required of all engineering students on the completion of the second year, is being given at Homewood, from June 7 to July 7, 1916, inclusive. *Six days a week.* Professor Tilden, Mr. Jones and Mr. Weaver.

In connection with the courses in Strength of Materials and Transportation, Professor Tilden conducted a series of field exercises in emergency bridge-building. Several of these bridge drills were held during the year and a double-lock spar bridge, of about thirty-eight feet span, with a floor nine feet wide, was built across a ravine on the University grounds. The drills were open to volunteers from the Junior and Senior classes and offered opportunity for practice in the rapid handling of heavy timbers, making the right kind of knots and lashings with rope, and the disposition and ordering of groups of men for doing work of this kind by "man-power."

Several excursions have been made by the Senior class in Civil Engineering to points of engineering interest near Baltimore. These excursions are conducted as regular class exercises, and are in charge of a member of the faculty. The students are required subsequently to present a written report covering the engineering features of the trip. Mr. Jones has also taken the Seniors to Washington, D. C., for an inspection trip of that city's new filtration plant, which is one of the best in the country. Mr. Jones was Assistant Superintendent of the plant for five years before coming to Johns Hopkins University, and so has an intimate knowledge of all its details.

Shortly before the close of last year the Board of Trade Research Fund, established through the generosity of Mr. B. Howell Griswold, Jr., became available for the use of the Department of Civil En-

gineering. As suggested in Professor Tilden's letter to you of April 28, 1915, it is planned to use this money in making an investigation of cement mortars and concretes especially with reference to materials and conditions obtaining in Maryland. Mr. Weaver has begun this work under Professor Tilden's direction, has purchased some of the necessary equipment, and collected typical specimens of sand and devoted such time as he could spare from his duties in class and drafting room to this investigation.

ELECTRICAL ENGINEERING

Advanced Courses

Seminary and Journal Meeting. *One hour weekly through the year.* Professor Whitehead.

Advanced Electrical Engineering. *Three hours weekly through the year.* Professor Whitehead.

(a) First half-year: Electrical Transmission of Energy.

(b) Second half-year: Theory of Radio Transmission.

Advanced Electrical Measurements. *Two hours weekly through the year.* Dr. Kouwenhoven.

Undergraduate Courses

Electrical Engineering 1. *Four hours weekly through the year.* Professor Whitehead and Mr. Pullen.

Electrical Engineering 2. *Three hours weekly through the year.* Professor Whitehead.

Electrical Engineering 3. *Three hours weekly through the year.* Dr. Kouwenhoven.

Laboratory Work. *Five afternoons weekly through the year.* Professor Whitehead, Dr. Kouwenhoven and Mr. Pullen.

The Seminary and Journal Meeting has met weekly through the year. The following papers were presented in the Seminary:

Professor Whitehead: "The Cost of Electric Power."

Associate Professor Christie: "Municipal Electric Power Plants of Western Canada."

Dr. Kouwenhoven: "A Method for Determining the Correctness of Watthour Meter Connections."

Mr. W. S. Brown: "Pure Electron Discharges"; "Continuous Waves in Long Distance Radio Telegraphy."

Mr. C. H. Willis: "Feeder Regulators."

Mr. G. C. Reier: "Railway Motor Control."

Mr. D. H. Johnston: "Structural Design of Transformers."

Mr. A. Tobias: "Notes on the Synchronous Converter."

Mr. J. G. Webster: "Structural Features of Railway Motors."

Two lectures have been given by visiting electrical engineers. Local engineering societies and the public were invited to these lectures. The speakers and their subjects were:

Mr. John L. Hogan, Jr.: "The Present State of Radio Transmission."

Dr. Saul Dushman: "Electron Emission from Heated Metals."

A number of trips for inspection of electrical engineering plants and projects have been taken by the advanced classes in charge of members of the faculty. These have included, besides visits to several plants in and about the city, a trip to the Pennsylvania Water and Power Company's plant, at Holtwood, Pa., and to the Naval Experiment Station and the collier Jupiter, at Annapolis.

Professor Whitehead with the assistance of Mr. Pullen has continued his studies of the electric properties of air at atmospheric pressure. The results have been published in two papers.

Dr. Kouwenhoven has completed his experimental study of certain obscure questions in the performance of polyphase watt-hour meters and the results have been published. Dr. Kouwenhoven has also begun an investigation of the losses in laminated iron at high frequencies.

Mr. W. S. Brown, under the direction of Dr. Whitehead, has completed an experimental study, comparing the electrical properties of atmospheric air when subjected to alternating and continuous potentials. The results were offered by Mr. Brown as his dissertation for the Degree Doctor of Philosophy.

The following papers have been published:

J. B. Whitehead and M. W. Pullen: "The Corona Voltmeter," *Proceedings, American Institute of Electrical Engineers*, June, 1916.

J. B. Whitehead: "The Corona as a Standard of High Voltage," *Electrical World*, June 17, 1916.

W. B. Kouwenhoven: "A Method of Determining the Correctness of Polyphase Wattmeter Connections," *Proceedings of the American Institute of Electrical Engineers*, February, 1916.

Continuing the work of equipping the laboratories, a considerable amount of new apparatus has been installed during the year. Particular mention may be made of the equipment for radio telegraphy, which has been designed and installed by the laboratory force headed by Mr. Wm. Keyser, Jr. An admirable card record and marking system for the numerous instruments and other electrical equipment has been developed by Dr. Kouwenhoven.

Professor Whitehead as delegate of the American Institute of Electrical Engineers to the Pan-American Scientific Congress, served as Chairman of one of the Sub-Sections of the Congress. He has also continued in the office of Chairman of the Electro-Physics Committee, of the American Institute of Electrical Engineers, conducting the editorial and other work associated with that office. He was also appointed Associate Member of the Naval Consulting Board, and director for Maryland in the Survey on Industrial Preparedness, on the recommendation of the American Institute of Electrical Engineers.

MECHANICAL ENGINEERING

Undergraduate Courses

Mechanical Engineering 1. Thermodynamics of Power Production. *Four hours weekly through the year.* Professor Thomas.

Mechanical Engineering 2. Design and Operation of Power Ma-

chinery. *Three hours weekly through the year.* Associate Professor Christie.

Mechanical Engineering 3. Design of Machine Parts and Calculation of Stresses. *Three hours weekly through the year.* Professor Thomas.

Mechanical Engineering 4. Gas Manufacture and By-Product Recovery. *Two hours weekly through the year.* Mr. F. H. Wagner (Special Lecturer), and Mr. J. H. Billings.

Kinematics of Machinery. *Four hours weekly, second half-year.* Mr. Billings.

Industrial Organization. *One hour weekly, second half of fourth year.* Associate Professor Christie.

Journal Meeting and Seminary. *One hour weekly through the year.* Professor Thomas.

During the year 1915-16 instruction by means of lectures, laboratory and drafting has been given to 37 second year undergraduates, to 34 third year undergraduates, and to 4 fourth year undergraduates. Beside these, one graduate of last year in Civil Engineering has taken the fourth year work in Mechanical Engineering. Seven fourth year students have taken the course known as M. E. 2, including lectures and laboratory. Seventeen students (fourth year and graduates) have taken a special course in Gas Manufacture and By-product Recovery with laboratory work; ten fourth year men the course on Industrial Organization, M. E. 4. Nine fourth year students and graduates have participated regularly in a weekly Journal Meeting and Seminary; one special student attended a single course, and did laboratory work, and three graduates (two from Purdue University and one from Johns Hopkins) did special research work and have attended certain of our regular courses.

The following topics have been discussed in the Journal Meeting and Seminary:

C. C. Thomas: Some points in the theory of the internal combustion engine; present practice in motor car design.

J. H. Billings: The manufacture of ball bearings; the manufacture of shells for guns; cotton spinning machinery; die casting.

A. G. Christie: Sugar manufacture; paper manufacture; design of steam turbine blading; factories and rate regulation.

G. A. Weschler: A duplex radiator for heating buildings; heat transfer in refrigeration systems; heat transfer in heating systems; manufacture of shells for the United States navy.

J. Levin: Heat transmission in condensers (2 papers).

F. T. Iddings: Manufacture of sulfuric acid; manufacture of artificial fertilizers.

H. Wacker: Comparison of efficiency of refrigeration systems; coal and ash handling machinery.

M. Reiner: The manufacture of rubber; the manufacture and uses of liquid air; characteristics of American coals.

H. W. Woodward: A continuous gas calorimeter; the effect of superheated steam on cast iron; tar extractors.

J. M. Lednum: A comparison of existing boiler inspection laws; causes of boiler explosions; the manufacture of cans and canning machinery.

Mr. H. L. Gantt, Consulting Engineer, of New York City, delivered a lecture on Industrial Leadership which was largely attended by local engineering societies as well as members of the University.

Professor Thomas has acted as Delegate to the meetings of the International Engineering Congress and the International Gas Congress at the Panama-Pacific Exposition; as representative of this University at the meeting of the Association of American Universities at Berkeley, California; as representative of the American Society of Mechanical Engineers, and also of the Johns Hopkins University, and as Chairman of one of the Sub-Sections, at the Second Pan-American Scientific Congress held in Washington; as an Associate Member of the United States Naval Consulting Board and a Maryland State Director appointed by the American Society of Mechanical Engineers, on the Industrial Preparedness Board; and as Member of the Research Committee and various other committees of the American Society of Mechanical Engineers.

Research in several directions has been carried on during the past year, including investigation of improved methods of cooling water for power plant purposes; the separation of tar from gases; an analysis of the performance of smoke-stacks; the flotation of ores in mining operations; the calibration of a triangular weir with brine of different densities and temperatures; and an investigation of the heat losses throughout an ammonia refrigeration system. It is hoped to publish the results of a number of these investigations during the next few months.

Associate Professor Christie has published a series of 18 articles reporting his investigations on the comparative costs of operation of municipally owned and privately owned lighting and power stations. He has also contributed valuably to the research work mentioned above and has served on various committees.

Important research work has been carried on by Dr. David T. Day of Washington, assisted by a special student and by the Department of Mechanical Engineering. This work has yielded important results in the cracking of petroleum vapors by compressing them to a high pressure and temperature in the Diesel engine in our laboratory.

The United States Navy Department is now making use of our special air equipment in an extended investigation of means for determining the capacity of blowers and other air-supplying apparatus used on war ships. This investigation bids fair to yield exceedingly valuable scientific data on the general subject of air-measurement and the results are to be published in the Journal of the American Society of Naval Engineers, with full credit being given to the University for having supplied the method and apparatus used as a standard in the investigations.

The combined efforts of the Department of Mechanical Engineering and Mr. F. H. Wagner, who has been a special lecturer during the past year, have resulted in obtaining a fund of \$3,300, and some donations of apparatus for erecting a small coal-gas plant in our laboratory, which it is hoped will be ready for use by the opening of the coming college year. This plant will be for the purpose of studying special problems in the recovery and use of the by-products from coal-gas manufacture and thus contributing to the independence

of this country in so far as the manufacture of aniline dyes, explosives, and various chemicals is concerned. It is hoped that this work and the lectures accompanying it may be conducted as a part of a course in Chemical Engineering. Preliminary arrangements have been made for carrying on the lecture and laboratory work in this subject during the coming year.

In our last report your attention was called to the growing demand for the establishment of courses in Chemical Engineering. We emphasized the hope that it would soon be possible to make provision for a professor of Chemical Engineering and the necessary assistants and laboratory equipment. This matter has been discussed during the past year in an effort to determine whether a start can be made, notwithstanding the fact that it is not yet possible to establish a course in this branch co-extensive with those in the present branches of Engineering. We believe that it would be possible to offer a course made up principally of existing courses in Engineering together with existing courses now offered in the Department of Chemistry. We believe, for example, that a course eliminating one course in Engineering in each of the last two undergraduate years, and substituting for them existing courses in Chemistry, would provide excellent training for a student planning to enter the field of Industrial Chemistry or Chemical Engineering. It would, apparently, be entirely feasible to offer such a course. Up to this time, however, discussion of the matter has not resulted in a conclusion as to the proper degree to be conferred upon its completion.

C. J. TILDEN,

Professor of Civil Engineering.

C. C. THOMAS,

Professor of Mechanical Engineering.

J. B. WHITEHEAD, *Secretary,*

Professor of Electrical Engineering.

SCHOLARSHIPS IN THE DEPARTMENT OF ENGINEERING CREATED BY ACT
OF LEGISLATURE, 1912

To Graduates of Maryland Colleges

Joseph R. Branham (S. B., Washington College).
J. Wilmerton Darley (A. B., Western Maryland College).
John L. De Marco (S. B., St. John's College).
James M. Lednum (S. B., Maryland Agricultural College).
Edgar K. Pfitsch (S. B., Washington College).
George C. Reier (A. B., Washington College).
Lloyd R. Rogers (S. B., Maryland Agricultural College).
Carl L. Schaeffer (A. B., Western Maryland College).
Joseph G. Sebold (A. B., Mount St. Mary's College).
George W. Strong (A. B., Rock Hill College).
George L. Winslow (A. B., St. John's College).

(11)

To Residents of Baltimore City and the Counties

Kenneth O. Bitter, of Baltimore County.
Charles W. Black, of Baltimore (Fourth District).
Everette L. Bowen, A. B., of Calvert County. [Senatorial]
James L. Bowling, Jr., of Charles County.
I. Vernon Brumbaugh, A. B., of Caroline County. [Senatorial]
Guy L. Bryan, Jr., of Dorchester County. [Senatorial]
William D. Cecil, of Queen Anne's County. [Senatorial]
Charles W. Chesley, of St. Mary's County. [Senatorial]
Theodore L. Chisholm, of Montgomery County.
Edwin C. Clayton, of Baltimore (Fourth District).
Hyman A. Cohen, of Harford County.
George H. Cronin, of Harford County.
John L. Defandorf, of Montgomery County. [Senatorial]
Ryland N. Dempster, of Baltimore (Third District).
Richard S. Dodson, Jr., of Talbot County.
Cyrus L. Doub, of Frederick County. [Senatorial]
John J. Downey, of Montgomery County.
Howard H. Elliott, of Baltimore (Fourth District).
Harry Ewald, of Allegany County.
Frank I. Fonaroff, of Baltimore (Fourth District).
Robert B. Garrett, of Garrett County. [Senatorial]
E. Gerry Hall, of Baltimore (Third District).
Milton L. Hancock, of Worcester County.
George S. Harris, of Queen Anne's County.
John Y. Hollingsworth, of Harford County.
Stanley L. Howard, of Baltimore County.
Harold Hurlow, Jr., of Baltimore County.
Ulric O. Hutton, of Montgomery County. [At large]
J. Suter Jammer, of Allegany County.
John R. Johnston, of Washington County.
Lloyd E. Johnston, of Somerset County.
Albert B. Junkins, of Baltimore (Fourth District). [Senatorial]
Erman R. Kauffman, of Carroll County.
Jacob F. Kauffman, A. B., of Caroline County.
Edmund J. Kean, of Allegany County.
Clarence E. Keefer, of Baltimore (Third District).

Joseph L. Krieger, of Baltimore. [At large]
 Jacob Levin, of Baltimore (First District). [Senatorial]
 Morris Levin, of Baltimore (First District).
 Roger E. Martz, of Washington County.
 Louis Meyerhoff, of Baltimore (Second District).
 Daniel T. Ordeman, of Frederick County.
 Noble L. Owings, of Baltimore (Third District). [Senatorial]
 Edward E. Perkins, Jr., of Prince George's County. [Senatorial]
 Abraham Pikoos, of Baltimore (First District).
 William B. Pratt, of Cecil County. [Senatorial]
 Henry L. Prince, Jr., of Baltimore County.
 G. W. Harold Reed, of Washington County.
 Milton Reiner, of Baltimore (Second District).
 George C. Rhoderick, Jr., of Frederick County.
 John D. Roop, Jr., of Carroll County. [Senatorial]
 Jacob S. Rosenthal, of Baltimore. [At large]
 George B. Shawn, of Caroline County.
 Eli Silberstein, of Baltimore (First District).
 John S. Stanley, of Prince George's County.
 E. Guy Stapleton, of Baltimore County. [Senatorial]
 Bernard A. Sullivan, of Baltimore. (Second District). [Senatorial]
 Joseph P. Thompson, of Baltimore. [At large]
 Benjamin T. Truitt, Jr., of Worcester County. [Senatorial]
 James L. Tull, of Anne Arundel County. [Senatorial]
 John M. Twigg, of Allegany County. [Senatorial]
 Herman Wacker, Jr., of Baltimore (Fourth District).
 E. Lauman Warner, of Baltimore County.
 J. Stuart Watson, of Charles County. [Senatorial]
 William D. Webb, of Harford County. [Senatorial]
 Walter E. Weeks, of Baltimore (Third District).
 Joseph Weil, of Baltimore (Second District).
 Paul R. Wiggins, of Baltimore (Second District).
 Alexander McW. Wolfe, of Baltimore. [At large]
 John W. Young, of Somerset County. [Senatorial]
 Louis McC. Young, of Washington County. [Senatorial]
 Charles T. Zahn, of Carroll County.
 Louis M. Zeskind, of Baltimore (First District).

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**SPECIAL SCHOLARSHIPS IN THE DEPARTMENT OF ENGINEERING
 NOT PROVIDED FOR BY THE LEGISLATURE BUT CREATED
 BY THE TRUSTEES FOR MARYLAND STUDENTS
 ENTERING IN OCTOBER, 1912**

David H. Barron, of Baltimore.
 James P. Cockey, of Baltimore County.
 R. Wilson Evitt, of Baltimore County.
 Frederick T. Iddings, of Howard County.
 David H. Johnston, Jr., of Baltimore.
 E. LeRoy Smith, of Harford County.
 Abraham Tobias, of Baltimore.
 James G. Webster, of Baltimore.
 Walter A. Wood, Jr., of Baltimore County.
 Hiram W. Woodward, of Baltimore.

(10)

REPORT OF THE DIRECTOR OF THE GYMNASIUM

TO THE PRESIDENT OF THE UNIVERSITY:

I should like to make a report of the present condition of the department of physical training, and then to follow up with a few specific suggestions as to its future organization.

For several years past the gymnasium has been administered through my office, with the help of only one gymnasium instructor, Mr. Kistler, who has been very efficient. With this force we have organized a General Athletic Association, which is the Student Board of Control for intercollegiate athletics. Though nominally independent, it is, under the present regime, subject to the veto power of the Trustees and Faculty through my office.

We have gotten along fairly well except in the case of football, which has recently come in for a good deal of criticism, chiefly owing to the fact that we have had no specific ruling or practice against the presence of any bona fide member of the University on our athletic teams. I think that this criticism could be obviated without any special ruling by insisting on regular practice of the team, at which practice every member of the squad should be compelled to be present. This would of itself necessitate that all the medical students and most all of the graduate students should drop out of intercollegiate athletics. Intercollegiate athletics, in other words, would force a purely undergraduate team on the field, which is the desire of the majority of our students and the unanimous desire of the undergraduate body.

In regard to the number of students participating in active sports, we can say of last year that about fifty per cent. were engaged in intercollegiate sports, including baseball, track, lacrosse, football, and tennis. Basketball is not an intercollegiate sport with us. Previous to this year we have had as many as seventy per cent. of our students in active competitive sports. The drop to fifty per cent. last year is explained by the fact that a goodly number of the Engineering students, who were out at Homewood, could not be organized with the teams quite as well as the students who were already at the cage and gymnasium.

I now want to make a distinction between intercollegiate and intramural sports. Most of our athletic activities up to this time have been almost entirely intercollegiate. I believe intercollegiate athletics should be fostered. They bring about a healthful influence in college life, and a loyalty to the college that no other thing seems to do. When controlled properly they are conducive of good to most of the students who enter into the various games. Intracollege activities are, however, of far greater importance when the question of numbers of students is concerned. All intracollege or intramural activities minister to the great needs of students and are, therefore, really a part of physical

training, and physical training should be required of every student in the college.

The intramural sports conducted under the physical training regime take care of the health, allow recreation, and help build up the character of all students. They supply the recreative need of the students as a whole, and it is my opinion that both intercollegiate activities and intramural sports should be fostered at this institution from the point of view of physical training. I feel that intramural activities, because of their influences for good on the individual, should be given the greater weight, and I should like to see a system established here, under which all the undergraduate students, if not the graduates, would be organized into classes for competitive athletic activities. I think that intramural sports should be regarded as physical training, and conducted by game masters or athletic instructors, who would be virtually members of the faculty. I would, for instance, have an individual of a high type who would be athletic instructor, and under him other assistants or instructors for the squads in the various games as necessity would demand. For instance we could have a game master in soccer, hockey, football, tennis, lacrosse, and handball, insist that every student spend the required number of hours each week in some of these sports, and give credit for the time spent on account of their physical training.

At present we have physical training required for the first two years. It would be better were it extended to four years, with three periods a week. This would in no way affect the work in military training. For a balance could be made between the active work in military training and physical training and active sports, so that credit could be given for one or the other, as might be deemed best by those in charge.

Military training, which is a new adjunct to this department, though it is a little too early to judge, bids fair to have a wonderful growth, and admirably fits into our present physical conditions. Owing to a lack of a large gymnasium or cage at Homewood, we are, however, working under great disadvantages. We have neither sufficient equipment nor a drill hall. The students are interested in this line of work, and it is my opinion that already it has done them much good. There is not, however, so far, a sufficient amount of physical training in this course. I think, therefore, that the students under military training could be easily expected to take active part in organizing intramural sports.

The military training, I believe, should be under the department of gymnasium, but administered by the Instructor in Military Science assigned by the War Department. Yet we should keep a faculty control over this work in every respect outside the rulings of the National Government.

Every student should have recreative activities, one hour daily. I believe it would be correct for us to require under proper organization three periods a week. We could put special interest with interclass, interclub, intersociety, etc., competition, i. e., physical activities, various games or sports. We should keep control of intercollegiate sports, as now regulated through the Athletic Association.

I would most strongly urge that an all-time man as Athletic Instructor be engaged. It would be my idea that his duties would be to look after the various sports, probably coaching one or two teams himself, and supervising others through assistants, and keeping records of the various students engaged in the different games. If we developed intracollege athletics we could have both indoor and outdoor work carried on through the various seasons, taking in all students except those physically incapacitated. In the fall we could have outdoor baseball, track, cross-country, soccer, and football; during the winter, indoor wrestling and boxing, basketball, handball, indoor track; and in the spring, baseball, track, cross-country, lacrosse, swimming, etc., when facilities could be provided to carry out such an idea. We need, as I have already suggested, game-masters or instructors to carry on the actual organization of the squad, physical equipment such as handball courts, tennis courts, and play fields. I believe this scheme worked out under the gymnasium department would approximate the ideal, and would take care of the physical condition, health condition, and morals of the students in the best possible manner.

The Athletic Association is a student organization which has to do with all activities pertaining to intercollegiate sports. There is a Graduate Manager, who is also Treasurer and a paid bonded official. (The Athletic Association is incorporated). I should like to suggest a combination of offices which may be advantageous to the University, the Alumni Association, and the Athletic Association. It seems to me that, if we could get a first-class whole-time man, efficient in the lines of work proposed, he could take care of the management of the business end of the Athletic Association, as well as the press agent work connected therewith, and at the same time act as publicity agent for the University. This suggests the possibility of having the same individual as active Secretary for the Alumni Association. This seems, on the face of it, a lot of work for one individual, but there is so much of work in common in these different offices that, if they were concentrated in one office, much good would result therefrom.

I think, then, in the organization of this department we should have a Director of the Gymnasium, who should be a medical man, by whom all the different sub-departments should be supervised as is the case now. Under the gymnasium department we should have physical training, hygiene, military training, intramural activities, and the general Athletic Association, which has to do with the intercollegiate sports. The different game-masters or instructors could be under the Director of the department or of an instructor in athletics. At present the only two undertaking this work are the Director and the Gymnasium Instructor, Mr. Kistler. The intercollegiate activities are of course looked after by the General Athletic Association. There is great need of a secretary or stenographer to help keep records and carry on the clerical work of this department.

RONALD T. ASHCROMBIE,
Director of the Gymnasium.

REPORT OF THE REGISTRAR

TO THE PRESIDENT OF THE UNIVERSITY:

During the year 1915-1916 the academic staff included two hundred and fifty-one teachers, eighty-eight in the philosophical and engineering departments and one hundred and sixty-three whose work lay wholly or chiefly in medicine. There were also twenty three lecturers, most of them non-resident, who gave single lectures or short courses. The number of students enrolled in the regular courses was nine hundred and forty-nine, of whom four hundred and ninety-one were residents of Maryland, four hundred and forty-four came here from forty-three other States and Territories of the Union, and fourteen from foreign countries. Among the students were six hundred and twenty-five already graduated, of whom two hundred and twenty-six were enrolled in the department of Philosophy and the Arts (including forty-nine women), three hundred and eighty in the department of Medicine (including thirty-nine women), and nineteen in the department of Engineering. There were one hundred and seventy-five candidates for the degree of Bachelor of Arts, one hundred and twenty-eight candidates for the degree of Bachelor of Science in Engineering, and twenty-one were enrolled as special students, pursuing courses of study for which they seemed fitted, without reference to graduation. The college courses for teachers were attended by three hundred and forty-three persons; the summer college and graduate courses of 1915 by four hundred and twenty-eight; the summer courses for physicians (1915) by fifty-nine. The enrolment for the year is summarized below:

Faculty

President and Professors.....	62
Clinical Professors.....	7
Associate Professors.....	36
Associates	34
Instructors and Assistants.....	112
	— 251
Lecturers for the year.....	23

Students

I. Graduate Students:

A. Department of Philosophy:

1. Fellows by Courtesy.....	25
2. Fellows:	
University	16
Adam T. Bruce.....	1
William S. Rayner.....	1
Edmund Law Rogers.....	1
Ilse Schmidt.....	1
3. George Peabody Scholar.....	1

Report of the Registrar

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4. Other Graduate Students:	
a. Candidates for higher degrees.....	181
b. Special Students.....	49
	<hr/> 226
B. Department of Medicine:	
1. Candidates for the degree of Doctor of Medicine	353
2. Physicians attending Special Courses.....	27
	<hr/> 380
C. Department of Engineering:	
1. Candidates for higher degrees.....	2
2. Candidates for the degree of Bachelor of Science in Engineering	14
3. Special Students.....	3
	<hr/> 19
II. Undergraduate Students:	
1. Candidates for the degree of Bachelor of Arts....	133
2. Candidates for the degree of Bachelor of Science in Engineering	108
3. Candidates for Matriculation.....	62
4. Special Students.....	21
	<hr/> 324
Total	949
III. Attendants on College Courses for Teachers.....	343
IV. Attendants on Summer Courses:	
1. Courses for Physicians.....	59
2. Graduate and College Courses.....	428
	<hr/> 487
Total receiving instruction.....	1779
Counted twice.....	111
	<hr/> 1668
Net total.....	1668

During the first forty years of the University's existence, eight thousand three hundred and eight individuals attended the regular courses. Three thousand two hundred and ninety were registered as from Maryland (two thousand five hundred and twenty-seven from Baltimore) and five thousand and eighteen from eighty-three other states and countries. Five thousand six hundred and eighty-five persons entered as graduate students and two thousand six hundred and twenty-three as undergraduates. Of the undergraduates, six hundred and ninety-three have subsequently followed graduate courses here, many of them proceeding to higher degrees. The total number of graduate students enrolled is six thousand three hundred and seventy-eight. The following table shows the enrollment from the beginning:

	Total *	Graduates (Inc. Fellows)	Undergraduates		College Courses for Teach- ers	Summer Courses
			Candidates for Degrees	Special		
1876-77	89	54	12	23		
1877-78	104	58	34	22		
1878-79	123	63	25	35		
1879-80	159	79	32	48		
1880-81	176	102	37	37		
1881-82	175	99	45	31		
1882-83	204	125	49	30		
1883-84	249	159	53	27		
1884-85	290	174	69	47		
1885-86	314	184	96	34		
1886-87	378	228	108	42		
1887-88	420	231 { Phil., 220 Med., 11	127	62		
1888-89	394	216 { Phil., 202 Med., 14	129	49		
1889-90	404	229 { Phil., 209 Med., 20	130	45		
1890-91	468	276 { Phil., 233 Med., 43	141	51		
1891-92	547	337 { Phil., 298 Med., 39	140	70		
1892-93	551	347 { Phil., 297 Med., 50	133	71		
1893-94	522	344 { Phil., 261 Med., 83	123	55		
1894-95	589	412 { Phil., 284 Med., 128	126	51		
1895-96	596	406 { Phil., 253 Med., 153	149	41		
1896-97	520	344 { Phil., 210 Med., 134	144	22		
1897-98	641	456 { Phil., 215 Med., 241	152	33		
1898-99	649	462 { Phil., 210 Med., 252	163	24		
1899-1900	645	469 { Phil., 185 Med., 284	159	17		
1900-01	651	473 { Phil., 168 Med., 305	158	20		
1901-02	694	530 { Phil., 172 Med., 358	158	6		
1902-03	695	532 { Phil., 187 Med., 345	147	16		
1903-04	715	556 { Phil., 202 Med., 354	141	18		
1904-05	746	563 { Phil., 195 Med., 368	160	23		
1905-06	720	530 { Phil., 162 Med., 368	163	27		
1906-07	671	504 { Phil., 158 Med., 346	146	21		
1907-08	683	518 { Phil., 171 Med., 347	142	23		
1908-09	731	562 { Phil., 187 Med., 375	138	31		
1909-10	821	595 { Phil., 188 Med., 407	143	14	69	
1910-11	916	625 { Phil., 210 Med., 415	180	10	101	
1911-12	1206	623 { Phil., 217 Med., 406	170	9	118	335†
1912-13	1090	600 { Phil., 215 Med., 385	192 { A. B., 165 S. B. (E), 27	8	119	201
1913-14	1325	607 { Phil., 213 Med., 378 Eng., 16	249 { A. B., 170 S. B. (E), 79	14	167	347 { Coll., 277 Med., 70
1914-15	1413	637 { Phil., 235 Med., 383 Eng., 19	273 { A. B., 169 S. B. (E), 104	16	189	356 { Coll., 287 Med., 69
1915-16	1668	625 { Phil., 226 Med., 380 Eng., 19	303 { A. B., 175 S. B. (E), 128	21	343	487 { Grad., 65 Coll., 363 Med., 59

* Including duplicates.

† Summer of year first named, and so below.

The geographical distribution of the students in the regular courses is shown by the following table:

	From Maryland.	From Other States and Countries.		From Maryland.	From Other States and Countries.
1876-77	59	30	1896-97	254	266
1877-78	71	33	1897-98	279	362
1878-79	76	47	1898-99	277	372
1879-80	97	62	1899-1900	262	383
1880-81	95	81	1900-01	270	381
1881-82	97	78	1901-02	273	421
1882-83	106	98	1902-03	283	412
1883-84	123	126	1903-04	294	421
1884-85	130	160	1904-05	312	434
1885-86	130	184	1905-06	304	416
1886-87	162	216	1906-07	257	414
1887-88	199	231	1907-08	267	416
1888-89	183	211	1908-09	311	420
1889-90	215	189	1909-10	286	466
1890-91	235	233	1910-11	337	478
1891-92	273	274	1911-12	337	465
1892-93	266	255	1912-13	358	442
1893-94	260	262	1913-14	436	420
1894-95	260	329	1914-15	487	439
1895-96	272	324	1915-16	491	458

The enrolment in the medical department, not including the summer courses, has been as follows:

Candidates for M.D.			Drs. of Med.	Total.	Candidates for M.D.			Drs. of Med.	Total.				
1893-94	-	18	-	65	-	82	1905-06	-	293	-	75	-	368
1894-95	-	51	-	77	-	128	1906-07	-	263	-	83	-	346
1895-96	-	84	-	69	-	153	1907-08	-	277	-	70	-	347
1896-97	-	123	-	11	-	134	1908-09	-	297	-	78	-	375
1897-98	-	167	-	74	-	241	1909-10	-	334	-	73	-	407
1898-99	-	197	-	55	-	252	1910-11	-	351	-	65	-	416
1899-1900	-	211	-	73	-	284	1911-12	-	355	-	51	-	406
1900-01	-	209	-	96	-	305	1912-13	-	351	-	34	-	385
1901-02	-	229	-	129	-	358	1913-14	-	360	-	18	-	378
1902-03	-	256	-	89	-	345	1914-15	-	361	-	22	-	383
1903-04	-	276	-	78	-	354	1915-16	-	353	-	27	-	380
1904-05	-	291	-	77	-	368							

The attendance upon the regular graduate and undergraduate courses has been as follows during the last five years:

	1911-12	1912-13	1913-14	1914-15	1915-16
Mathematics	82	104	174	198	208
Physics and Astronomy	102	132	177	191	170
Chemistry	125	110	180	147	127
Geology and Mineralogy	47	51	57	65	63
Zoology, Botany, Plant Physiology	68	66	83	86	73
Greek	33	41	51	36	30
Latin	74	56	74	55	54
Classical Archaeology and Art	42	24	35	18	20
Sanskrit and Comparative Philology	24	27	26	33	25
Semitic Languages	26	16	22	17	32
English	163	191	251	271	248
German	115	104	116	114	110
French, Italian and Spanish	120	127	149	177	165
History	83	91	85	81	85
Political Economy	105	104	80	104	96
Philosophy	31	85	24	31	55
Philosophy, Psychology and Education	72	73	75	...	...
Psychology	...	...	...	17	23
Philosophy and Education	...	...	...	82	...
Philosophy	...	...	...	...	132
Education	...	...	...	...	10
Engineering (Civil, Elec. and Mech.)	...	...	47	78	96

The following tables record the enrolment in the College Courses for Teachers and in the Summer Courses since their initiation:

College Courses for Teachers

	1909-10	1910-11	1911-12	1912-13	1913-14	1914-15	1915-16
Mathematics	9	15	6	..	6	..	..
Chemistry .....	..	10	..	..	6	..	20
Biology	3	4	..	..	..	..	..
Latin	3	..	6	4	6	..	..
Hebrew .....	..	..	..	1	..	..	..
English Composition	29	28	36	26	27	27	49
English Literature.	16	8	22	32	49	46	50
German	4	6	9	23	25	6	22
French	2	5	12	17	35	33	33
History	7	15	12	4	8	9	10
Education .....	..	14	21	21	21	43	73
Psychology .....	..	..	..	7	9	11	34
Political Economy.	..	..	..	..	..	16	34
Hygiene .....	..	..	..	..	..	7	7
Italian .....	..	..	..	..	..	..	11
Spanish .....	..	..	..	..	..	..	6
Life Insurance.....	..	..	..	..	..	..	42

Summer Courses

	1911	1912	1913	1914	1915	1916
Mathematics	23	8	9	16	19	12
Physics	14	11	7	13	27	20
Chemistry	25	29	41	28	39	40
Biology	59	9	19	18	15	16
Latin	22	9	12	9	6	7
English Composition	121	65	51	68	72	93
English Literature.....	48	39	37	49	35	53
German	33	24	20	20	46	41
French	26	26	15	27	29	27
Spanish .....	..	..	..	..	9	30
History	56	31	50	43	44	71
Education	172	95	148	135	245	387
Domestic Science and Art	24	15	27	22	31	17
Manual Training.....	24	4	19	12	24	31
Politics .....	..	..	..	14	16	9
Playground and Recreation	..	..	..	..	16	14
Psychology .....	..	..	..	..	15	57
Geography .....	..	..	..	..	..	28
Economics .....	..	..	..	..	..	11
Penmanship .....	..	..	..	..	..	84

Degrees were conferred during the year upon one hundred and seventy-four candidates—Bachelor of Arts, twenty-seven; Bachelor of Science in Engineering, twelve; Bachelor of Science, three; Master of Arts, thirteen; Doctor of Philosophy, thirty-seven; Doctor of Medicine, eighty-two. Since degrees were first conferred, in 1878, twelve hundred and eighty-three persons have attained the degree of Bachelor of Arts; fifteen, the degree of Bachelor of Science in Engineering; three, the degree of Bachelor of Science (including two women); seventy-two (including nineteen women), the degree of Master of Arts; ten hundred and twenty-six (including twenty-two women), the degree of Doctor of Philosophy; and twelve hundred and twenty-five (including one hundred and ten women), the degree of Doctor of Medicine. The total number of individuals graduated is thirty-two hundred and eighty-six. Certificates of proficiency in applied electricity were awarded to ninety-one persons from 1889 to 1899.

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Summary of Degrees Conferred

A. B. Ph. D. M. D.				A.B. A.M. Ph.D. M.D. B.S. B.S.			
				(E.)			
1877-78	-	0	- 4 - ..	1897-98	-	49	.. 36 22 ..
1878-79	-	3	- 6 - ..	1898-99	-	38	.. 42 33 ..
1879-80	-	16	- 5 - ..	1899-1900	-	46	.. 35 43 ..
1880-81	-	12	- 9 - ..	1900-01	-	43	.. 30 53 ..
1881-82	-	15	- 9 - ..	1901-02	-	47	.. 17 57 ..
1882-83	-	10	- 6 - ..	1902-03	-	46	.. 27 49 ..
1883-84	-	23	- 15 - ..	1903-04	-	37	.. 31 45 ..
1884-85	-	9	- 13 - ..	1904-05	-	33	.. 35 54 ..
1885-86	-	31	- 17 - ..	1905-06	-	48	.. 32 85 ..
1886-87	-	24	- 20 - ..	1906-07	-	47	.. 35 76 ..
1887-88	-	34	- 27 - ..	1907-08	-	47	.. 28 63 ..
1888-89	-	36	- 20 - ..	1908-09	-	37	4 27 53 ..
1889-90	-	37	- 33 - ..	1909-10	-	14	3 25 69 ..
1890-91	-	51	- 28 - ..	1910-11	-	31	11 28 85 ..
1891-92	-	41	- 37 - ..	1911-12	-	37	5 32 85 ..
1892-93	-	40	- 28 - ..	1912-13	-	36	11 32 76 ..
1893-94	-	41	- 34 - ..	1913-14	-	52	13 30 91 ..
1894-95	-	37	- 47 - ..	1914-15	-	35	12 31 89 3 ..
1895-96	-	37	- 36 - ..	1915-16	-	27	13 37 82 12 3
1896-97	-	36	- 42 - 15				
				1283	72	1026	1225 15 3

THOMAS R. BALL,
Registrar.

REPORT OF THE LIBRARIAN

TO THE PRESIDENT OF THE UNIVERSITY:

At the end of the period covered by this my eighth annual report, the library has just finished the journey to Homewood, and McCoy Hall with its record closes June 30, 1916, save for the operations of the Summer School.

Before dismissing the old buildings from mind, a resumé of the reorganization effected there since the fire of September 17, 1908, is in order.

On that date our working quarters were destroyed, and damage by smoke and water done to the material in the three rooms and corridor adjacent, the Classical and Modern Language libraries below, and the attic above. In all rooms except the first named, reparation could be made by the bookbinder. There replacement was necessary.

As the fire occurred late in the season most of the summer's accessions, whether newly ordered or newly bound, pausing there for checking and plating, had passed along, so that the damage was largely that done to the material regularly stored there. So far as this had special value, it consisted mostly of the unbound publications of learned institutions, sometimes the file, generally the current volumes.

EXCHANGES

As in the main this had come to us by exchange, the opportunity to save for other pressing needs a substantial portion of the insurance money was seen to lie in adjustments of account here. This required the sifting and indexing of the correspondence of thirty years, efficiently done by Mr. Christian Dittus, the new manager of the Johns Hopkins Press, in which the custody of these records had formerly resided; the comparison of receipts and shipments in each case; the examination of each institution's published output; the formation of new treaties, whereby the lost material was restored, a *quid pro quo* from our stock being given where proper, and new serials added to our lists. The cash result was the saving of nearly \$25,000.

The record of these relations is indited now on a series of four types of cards, specially devised to receive it, and resting on the correspondence alphabetically and (then) chronologically filed. The first of those cards depicts the balance in periodicals, the second lists the duplicates sent; the third shows the (other) miscellaneous volumes sent; the fourth tabulates the volumes aside from periodicals received, on exchange account. All four filed under the name of the institution of the second part enable us readily to foot up the parallel columns and make appropriate changes from time to time. Such was the first task.

THE CATALOG

The next problem was the catalog.

This had been written on cards measuring about 2" x 5", whereas in the meantime 7.5 cm. x 12.5 cm (approximately 3" x 5") had come

to be the international standard. It was important that we adopt the common size, since a number of agencies, notably the Library of Congress, had come to printing for sale an appreciable percentage of the cards needed by us and of course at lower rates than we could produce them ourselves, while the scope of such stock seemed destined to extension. Accordingly we changed.

Again, the catalog had been framed without obedience to any recognized rules and by many hands, so that it lacked consistency and thoroughness, aside from having fallen into hopeless arrears. A new staff was therefore formed November 1, 1908, headed by Mr. W. B. Schulz, of the Library of Congress, with three (later four) trained associates, using typewriters.

The next step was taken the following April, when this new staff assumed the duty of maintaining the catalogs in all the departmental libraries, eleven in number; viz., Medical School, Biology, Chemistry, Geology, Physics and astronomy, Classics, Sanskrit, Semitics, Modern Languages, History, political economy and political science, and lastly Philosophy, psychology and education. This meant the duplication of such parts of the complete central catalog, already being made, as covered accessions in these subjects—all entries for the sciences, as being outside of McCoy Hall, main entries for the rest.

MULTIGRAPH

The clerical burden thus entailed and the resultant danger of increased error led to the search for an economical method of duplication. A half dozen machines were examined, and the multigraph adopted, since a test under the watch showed that four cards could be produced as quickly on it as on the typewriter, while our average number per title was not less. The result was cheapened production, doubling the printed portion of the catalog, disappearance of the copyist, and great reduction of the proof-reader's load. Today, the annual accessions have advanced 50 per cent., and all members of this staff have been provided with increases of salary, the department costs less than it did seven years ago.

CLASSIFICATION AND RECATALOGING

But it is poor comfort that the book is well described if it cannot be found when wanted. The card should bear notation of its whereabouts. We had depended on memory, tho the owner of the best of memories is mortal. The cause of this anomalous condition, like a city without house numeration is not far to seek. We had in theory and in reality not a library but a federation of departmental libraries, plus one of general character. These communities, being a dozen in number as already seen, were generally small in consequence, and therefore pretty well known in each case by those chiefly concerned. The day of confusion, however, was sure to come, and did come.

Still it would do little good to mark the current volumes if all were not to be so treated, as it would be futile to number only the new houses of a city. So in the spring of 1910 we proposed a plan of supplying call-numbers thruout the library and recataloging it completely, at an estimated cost of \$25,000.

Now supplying call-numbers, be it said to the uninitiated, is not as simple as it sounds. The books must first be arranged; that means grouped by topics, or classified thruout. The classification schedules adopted were those being worked out by the Library of Congress. In older institutions, the shelves are numbered and a book given the number of the shelf on which it stands. The weakness of this scheme lies in the necessity either of changing call numbers when one subject is moved to make room for an expanding neighbor, or of breaking the continuity of a subject. This has led to the appearance of another type wherein the notation is given to the topics instead of the shelves, so that, as long as their relative order be maintained, they may expand as unevenly as they will, yet the call-numbers need not be changed. Such a system was chosen here.

The great task of recataloging and classifying the entire library began June 1, 1910. A special staff was engaged for the purpose, joined by the regular staff, whose places were filled by temporary appointees. All subject entries of both divisions were assigned by the Chief Cataloger. Other entries were entrusted to Miss Elisabeth S. Thies, to whom accordingly credit for the mechanical accuracy of the work and the tactful guidance of the staff largely belongs. The classification of History and Political Science was in large measure the work of Dr. R. V. D. Magoffin, so far as it was not contained on the Library of Congress cards. German and the Romance group were similarly handled by Dr. Gustav Grünbaum. The remaining subjects have fallen to the Assistant Librarian, Mr. J. Mattern.

This work was brought practically to a close this year, at a cost of \$24,717.35, or about 1% under the estimate. 135,021 volumes at 18.3 cents each, or 74,343 titles at 33.2 cents each were covered, with an output of over 300,000 cards. In the central catalog there are now over 400,000 cards, with 300,000 more in the branches and shelf list, representing the activity of the Cataloging Department since its organization in November, 1908. Thus the insurance money was made to suffice for the reparation of fire loss and the recataloging of the library. Hardly an *ignis fatuus*!

In the meanwhile various other reforms had been set afoot.

ORDER DEPARTMENT

An Order Department, with the Librarian's Secretary, Miss Ethel Hubbard, in charge, was organized. A card was devised, with such rulings and captions as to receive on the one side of a vertical line the bibliographical description of a work to be bought, with name of the person recommending its acquisition, and on the other the record of purchase. This replaced blank sheets, whereon many titles could be written, with the obvious advantage, among others, of more ready consultation as a result of alphabetization. When the transaction is concluded these cards are retained to constitute a "source record." To make this feature of the library complete, a card for each work received by gift or exchange is added, with indication of date and origin of such accession.

The duplicates of the sheets on which the orders were mailed are kept in chronological sequence with the constituent titles of a calendar year consecutively numbered. This order number is, of course, repeated on the corresponding order card in each case.

To follow up the orders more readily, these numbers are once more set down on a separate sheet in columns consecutively, interrupted only by agent's name at start of each order. When an item is supplied the number is cancelled. A glance, therefore, at this sheet of numbers discloses at any time the list of outstanding orders. This, too, saves the more tedious checking of order sheets. A triplicate numbering stamp facilitates the formation of this index.

SERIAL RECORD

In the case of periodicals, however, such a card as that just described suffices only for the order, whereas special treatment is necessary for the record of receipts, since this is detailed, extending over a long period, and the number of outstanding orders is consequently large. The arrival of numbers was formerly chronicled daily in a series of folios with card index. But by discontinuing the folios, and ruling the card index itself to receive this record, the operating time was divided by four. This "serial record," as also the care of binding and accession statistics, is in the hands of Mr. A. C. Munzner, Jr.

ACCOUNTS

A new system of accounts was installed. Formerly the bills were transcribed in folio volumes. This was avoided by the simple expedient of requiring submission of bills in duplicate, and alphabetical filing. The detail is kept on two specially devised cards, one for credit, one for debit, with analysis under "books," periodicals," "binding," "miscellaneous." The former of these is employed also for the record of special fund expenditures.

GIFT RECORD

The substitution of cards for folios in the record of gifts proved a saver of time for both framer and consultant, since it secured one alphabet of donors, and, behind the name of each one, chronological sequence of his donations.

STATISTICS

The framing of a statistical card, counting and analysing each day's additions, not only first recorded these facts in complete and detailed form, but removed the last excuse for the maintenance of the laborious "accession books," in which bound volumes were set down in order of acquisition, consecutively numbered, and described. It was discontinued because it took no account of pamphlets, and every fact it contained is now available elsewhere.

ECONOMY

Some of the records here outlined are new; the rest are more exacting than ever. And yet, aside from the Cataloging Department, which represents a creation out of whole cloth, the same old staff, because of short-cuts discovered and despite heavily increased accessions, upholds the new program. And at Homewood, in a building half as large again as McCoy Hall, the salary budget suffers thereby practically no increase, tho hereafter every department gets direct library attendance, as against one-half of them before.

BOOK FUNDS

During the period under review the permanent funds for the increase of the library have nearly trebled in amount. The following table lists the new funds and the approximate annual income of each:

Increase in budget appropriation:

A. Philosophical and Collegiate Departments.....	\$3,000.00
B. Medical Department	500.00
H. B. Adams Fund (Hist., Pol. Econ., Pol. Sci. & Educ.)..	2,200.00
A. J. Robinson Fund (History).....	1,900.00
A. M. Elliott Fund (French literature).....	340.00
J. S. Gilman Fund (English).....	425.00
B. L. Gildersleeve Fund (Classics).....	425.00
Engineering budget.....	\$1,200.00-1,500.00
W. H. Welch Fund (Medicine, Pediatrics, Surgery).....	1,500.00
L. F. Barker Fund (Pediatrics).....	17.00

THE NEW BUILDING

The story ends, as good stories should, happily, in a new home. This has been repeatedly described and has awakened more than national interest, since, in adapting our old departmental library policy to modern storage conditions, we have set a new type and erected the first apartment house among the libraries of the world.

MOVING

Of the current year, upon which a report may now be briefly given, the chief event was naturally the removal to this and other new buildings at Homewood. The exodus of the library began on the morning of May 19, and was completed in six weeks, except for a few hundred volumes left behind for the Summer School, together with the Geological Library, which had to await the release of McCoy Hall shelving.

Tho the procedure was methodical and steady, the pace chosen was necessarily moderate, because of the scattered condition of the library in the old quarters. Subjects had outgrown their rooms and despite classification could be brought to order only by interfilming as they left. Another cause was the lack of new shelving on the spot, since because of a mishap only one-third was on hand at the outset, the rest to be delivered in three instalments.

Since the work was to be completed by the end of June, so that McCoy Hall might be ready for the Summer School and the books needed there might be moved to the Reading Room, the packing had to begin while classes were still in session. To avoid conflict with the teaching schedule required further nice calculation. It was, moreover, our task to see that offices and class rooms received their equipment, including varying amounts of shelving, to be selected with a view to minimum adjustment. Still the machine moved uninterruptedly, and finished on the day appointed, well within the scheduled cost.

The two sites are two miles apart. An auto truck, carrying seventy shelves of books and making four trips a day, was employed. The books were placed, titles up, in open boxes, each three feet long, so as to secure safety and order. The truck crew numbered twelve, part packing, part shelving, part operating the van.

A member of the library staff was at each end, and a third moved freely between the two, maintaining calculations. The rest followed their wonted tasks, the service of the library continued as usual, and a book was out of commission only in transit.

In this stack are the books in non-laboratory subjects—History, Political Economy and Political Science, in the two tiers corresponding to the top floor, with attendant in charge; the Modern Languages in the tiers corresponding to the floor of the Reading Room, where two attendants are to be stationed; and below this, the Ancient Languages, Philosophy and Education, with attendant in charge; while in the basement Biology is shelved for the time, under direct care of a student assistant.

The library of Physics and Astronomy is set up in a room of the Mechanical and Electrical Engineering building, and watched over by the secretary of these departments. That of Geology is to take its place in the Civil Engineering building and to be joined under the care of one attendant by the books in the latter subject, the cases being drawn from the Reading Room in McCoy Hall. Chemistry remains behind for a while, but the library gets a thoro reorganization, additional shelving and, next autumn, an attendant, for the first time.

ACCESSIONS

Irrespective of binding, we received, of books and pamphlets, by purchase, 4523 volumes in 4442; by gift, 3899 volumes in 3894; by exchange, 4473 volumes; by U. S. Government deposit, 277 volumes; by Maryland Geological Survey deposit, 32 volumes; J. H. U. manuscript dissertations, 2 (regular file not delivered because of moving operations); two copies each of 36 J. H. U. printed dissertations. Total 13,278 volumes in 13,192 pieces. In addition, we received 253 maps (4 by purchase, 191 by gift, and 58 by exchange), 3 manuscripts, 1 chart, and 50 odd numbers of periodicals.

Of these receipts 8534 were bound. As, however, 2484 volumes were withdrawn (1822 of these being returned to the U. S. Superintendent of Documents), the net bound accessions amounted to 6050 volumes. The present accession number of bound volumes in the library is 196,864.

The volume of exchanges continued low because of the war, and foreign shipments in general retarded. The effect of the British Orders-in-Council, March 1915, had brought the importation of books, as of other commodities from the Central Powers, to a standstill. But in the autumn arrangements were made for "Universities, colleges and public bodies" to resume the receipt of books, "philosophical, scientific, technical or educational" in character upon the certification by the Librarian of Congress of the importer of a named list of books. Fairly soon, however, difficulties developed between authorities and agents, so that by March, 1916, importation once more halted, and practically no material has come from Germany since. The year ended with no adjudication yet reached.

Important purchases were few in number. Orders were placed for the files of seven pedagogical journals; viz., *The Child* (6 v.), *Rural Educator* (5 v.), *Teachers Monographs* (19 v.), *Zeitschrift für schul-*

gesundheitspflege (28 v.) Lehrproben und lehrgänge aus der praxis der gymnasien und realschulen (125 pts)), Die deutsche schule (19 v.) and Zeitschrift für die erforschung und behandlung des jugendlichen schwachsinn (8 v.), tho less than half of the Lehrproben und lehrgänge, and none of the last two have reached us yet.

The set of so-called "Milan classics" in 25 volumes, i. e., Edizione delle opere classiche italiane dedicata al cittadino Melzi d'Eril, satisfies a want in the Reading Room.

Three additions to the Spanish shelves merit record: La Biblia vulgata latina trad. en Español, 1807-1816, 15 v.; J. M. de Pereda, Obras completas. 17 v.; B. Pérez Galdós, Episodios nacionales, 46 v. in 23.

The roll may be concluded with mention of F. Brinkley, Japan and China (12 v.); Canada and its Provinces (23 v.); Journal of the Virginia Constitutional Convention . . . 1864; National Electric Association, Proceedings (v. 1-36).

Mr. Blanchard Randall, of the Board of Trustees, made the most considerable gift of the year—985 volumes in the field of law.

Other donors included: Miss Emma J. Gillett, 59 miscellaneous volumes; President F. J. Goodnow, 138 miscellaneous volumes; Prof. J. H. Hollander, 18 volumes in political economy; Henry Holt & Co., 46 of their new publications; Dr. J. Howland, American Pediatric Society Transactions (18 v.), American Journal of Physiology (13 v.) and four other volumes; Dr. Ira Remsen, 102 miscellaneous volumes.

We have received also the usual annual gift of \$75.00 from Mr. and Mrs. Charles W. Field to maintain the von Lingen Collection of German geological surveys; as well as the customary anonymous gift of a year's subscription to the International Catalogue of Scientific Literature.

ANALYSIS OF EXPENDITURES

I. *Philosophical and Collegiate Departments*

Salaries	\$12,895.00
Books	4,526.18
Periodicals	4,804.49
Binding	4,402.91
Maps	85.98
A. L. A. cards.....	40.20
L. C. cards.....	300.00
Transportation and supplies.....	690.77
	<hr/> \$27,695.53

II. *Medical School*

Salary	\$600.00
Books	462.36
Periodicals	766.64
Binding	235.93
Conciliium bibliographicum cards.....	6.28
Miscellaneous	20.92
	<hr/> \$2,092.13

III. *Recataloging*

Salaries	762.21
	<hr/> \$80,549.87

CATALOGING DEPARTMENT

With the special recataloging staff reduced to one person, assisted for a single month by another, this department has about returned to normal. The recataloging operations were nearly confined to the Semitic department. A review of the entire work of this staff is given elsewhere.

In October this department adopted an experimental organization which will interest library executives. The prevailing custom is to have the same person responsible for both subject and main entries. We have, however, now, grouped in the hands of the Chief Cataloger, the assignment of subject headings and classification, while Miss E. S. Thies becomes responsible for main and other added entries. Theoretically, it seems sound, since call-number and subject heading are but two translations of the same thought, born each of an examination of the text—which is not true of other headings. We shall see what we shall see.

The tables which follow show that this department handled 10,961 titles, representing 18,537 volumes, for which 54,844 cards were made.

Cards:	Cataloging	Recataloging
Main entries (i. e. titles).....	8421	2540
Duplicate main entries.....	7716	2371
Added entries.....	15108	4208
Duplicate added entries.....	6147	572
Shelf list entries.....	2425	1905
Accession entries.....	668	158
Source entries.....	931	
Cross references.....	708	971
	42119	12725
Volumes	13541	4996

Of the titles handled this year cards were secured from the Library of Congress for 43%, from Berlin 1%, from American Library Association 2%, while record of the remaining 54% was prepared by us—multigraphed or typewritten. The proportions here are upset because of the non-arrival of the Berlin cards and the material covered by them.

Of the 54,844 cards prepared, 25,205 were printed by the Library of Congress, 390 by the Royal Library of Berlin, 436 by the A. L. A. Publishing Board, 10,981 on our multigraph, and the remaining 17,832 were typewritten.

In the Reading Room catalog which aims to be complete for the University, 35,908 cards were filed by the custodian. The total now is 401,781 cards.

In the Library of Congress depository catalog 38,555 cards were filed, in 311 hours, or 123 per hour—the highest record yet (cf. 96 last year). Further, 205 hours were spent in revision.

For incorporation in the union catalog of American libraries maintained in Washington by the Library of Congress, we selected 1875 of our current titles, and sent two cards for each.

BINDING

Slackening importations released some funds for a much needed extension of binding operations. Mr. Munzner reports having collated and sent to local binders 5473 volumes (cf. 2626, 2899, 3663, 4028 of the last five years respectively) which were bound at a cost of \$4490.25 or \$.82 per volume. This greatly increased number results despite the fact that moving operations prevented his handling before the close of the fiscal year the periodicals in the Biological, Chemical and Geological libraries, as well as those in the Reading Room. Of the total, 1596 volumes were rebound, and 93 went into Gaylord covers.

INTER-LIBRARY LOANS

In the operation of the inter-library loan system, we borrowed 155 volumes from 14 institutions, and lent 140 volumes to 34 institutions.

M. LEWELLYN RANNEY,
Librarian.

REPORT OF THE JOHNS HOPKINS PRESS

(ABSTRACT)

TO THE PRESIDENT OF THE JOHNS HOPKINS UNIVERSITY:

I submit herewith the report of the Johns Hopkins Press for the past year.

American Journal of Insanity. This journal is the official organ of the American Medico-Psychological Association. Its editorial control is in the hands of a committee of the association, consisting of Henry M. Hurd, M. D., and E. N. Brush, M. D., of Baltimore; G. Alder Blumer, M. D., of Providence, R. I.; J. Montgomery Mosher, M. D., of Albany, N. Y.; and Charles K. Clarke, M. D., of Toronto, Ontario. Volume LXXII (four numbers) was issued. This contained 722 pages, 8vo.

American Journal of Mathematics, edited by Professor Morley with the co-operation of Professors Cohen, Scott and other mathematicians. Numbers 3 and 4 (226 pages) completing Vol. XXXVII (460 pages, quarto) and two numbers of Vol. XXXVIII (220 pages) have been issued.

American Journal of Philology, edited by Professors Gildersleeve and Miller. Numbers 3 and 4 (252 pages) completing Vol. XXXVI (504 pages, 8vo.) and two numbers (254 pages) of Vol. XXXVII have appeared.

Beiträge zur Assyriologie und semitische Sprachwissenschaft, edited by Professor Haupt. No part appeared during the year.

Hesperia: Schriften zur germanischen Philologie, edited by Professors Collitz and Wood, and *Schriften zur englischen Philologie*, edited by Professor Bright. While several numbers are ready, none have been delivered to us owing to the suspension of German shipments.

Johns Hopkins Hospital Publications. We have continued the publication on behalf of the Johns Hopkins Hospital, of the *Bulletin*, appearing monthly, and of the *Reports*, of irregular issue.

Of the *Bulletin* six numbers (240 pages) completing Vol. XXVI (422 pages, 8vo.) and six numbers (192 pages) of Vol. XXVII have been issued.

Of the *Reports*, Vol. XVII (586 pages, quarto, with 21 plates and 136 figures) appeared in March. The following Monographs, reprinted from Vol. XVII, were also issued during the year:

Venous Thrombosis during Myocardial Insufficiency, by F. J. Sladen and M. C. Winternitz, 42 pages, 2 figures and 1 plate.

Leukemia of the Fowl: Spontaneous and Experimental, by Harry C. Schmeisser, M. D., 38 pages and 4 plates.

The Johns Hopkins University Circular, including the Annual Report of the President, University Register, Medical Department Cata-

logue, etc., T. R. Ball, Editor. Four numbers (642 pages) completing Vol. XXXIV (1218 pages, 8vo.) and six numbers (662 pages) of Vol. XXXV have been issued. These have included Conferring of Degrees, 1915; Notes from the Mathematical Seminary and Directory of Summer Courses, 1915, issued in July; Catalogue and Announcement for 1915-16 of the Medical Department, issued in October; Preliminary Register of the University, 1915-16, issued in November; Publications of Members and Graduates of the Department of History, Political Economy and Political Science, 1901-1915, issued in December; Report of the President, 1914-15, issued in January; Commemoration Day, 1916, Forty Years of Experimental Chemistry, 1876-1916, issued in February; Summer Courses, 1916, issued in March; University Register, 1915-16, issued in April. The Results of a Questionary on Psychological Terminology by Knight Dunlap, issued in May, and College Courses for Teachers, 1916-17, issued in June.

The Johns Hopkins University Studies in Historical and Political Science. The Studies are issued under the direction of the departments of history, political economy, and political science. One number (208 pages) completing Series XXXIII (614 pages, octavo) and three numbers (470 pages) of Series XXXIV have been published. These have included "The Constitutional Doctrines of Justice Harlan," by Floyd Barzilia Clark; "The Boycott in American Trade Unions," by Leo Wolman; "The Postal Power of Congress," by Lindsay Rogers; and "The Control of Strikes in American Trade Unions," by George Milton Janes.

Modern Language Notes. This journal was formerly edited by Professors E. C. Armstrong, J. W. Bright, B. J. Vos, and C. C. Marden as Managing Editor. Beginning with January, 1916, this editorial board was succeeded by J. W. Bright as Editor-in-Chief, M. P. Brush, William Kurrelmeyer, and J. E. Shaw, and the form of the *Notes* was changed from a quarto to an octavo. Two numbers (78 pages) completing Vol. XXX (278 pages, quarto) and six numbers (384 pages, plus xxxiv pages of bibliography, 8vo.) of Vol. XXXI were issued.

Elliott Monographs in the Romance Languages and Literatures, edited by Professor Armstrong. Three new numbers are in preparation.

Reprint of Economic Tracts, edited by Professor Hollander. No part appeared during the year.

Terrestrial Magnetism and Atmospheric Electricity, edited by Dr. Bauer. Numbers 3 and 4 (108 pages) completing Vol. XX (212 pages, 8vo.) and two numbers (108 pages) of Vol. XXI were issued.

There has been published another volume of the *Albert Shaw Lectures on Diplomatic History*, the title of which is "Early Diplomatic Relations between the United States and Mexico," by William R. Manning. It consists of 418 pages, 12mo.

There was also undertaken for the American Medico-Psychological Association, an important work on *Institutional Care of the Insane in the United States and Canada*, edited by Henry M. Hurd, William F. Drewry, Richard Dewey, Charles W. Pilgrim, C. Alder Blumer and T. J. W. Burgess, to be issued in four volumes with numerous illustrations. This work will contain a full and authori-

tative account of the Care of the Insane from the earliest periods in the United States and Canada, and promises to be of great value to Physicians, Alienists, Hospital Officials, Charity Workers and State, Public and Private Libraries. Volume I appeared in April and the other three volumes are announced for early publication.

The New Book Department received during the year 4889 volumes, including 1344 sent on inspection. Of these 3796 were purchased by members of the University, by the Library, 92, and 1001 were returned to the publishers.

Messrs. G. E. Stechert and Company, The Macmillan Company, and Messrs. Longmans, Green and Company have sent us regularly during the past year their publications, on inspection. By this arrangement the faculty is able to see the leading books and pamphlets that are published in Europe and also to a considerable extent those issued in America.

DISSERTATIONS PUBLISHED DURING THE YEAR

Following is a list of dissertations for the degree of Doctor of Philosophy published during the year, of which the required number of one hundred and fifty copies have been received by the University:

Blossom, F. A.: *La Composition de Salammbô d'après le correspondance de Flaubert (1857-1862).*

Bourne, Ella: *A Study of Tibur—Historical, Literary and Epigraphical—From the Earliest Times to the Close of the Roman Empire.*

Brown, Bessie Marion: *On the Reactions of Both the Ions and the Nonionized Forms of Electrolytes: On the Reactions of Methyl Iodide with Sodium, Potassium and Lithium Ethylates at 0° and 25°.*

Chandler, Joseph: *On the Reactions of Thiourazoles and Thiourazole Salts.* 1. A Study of the Reaction between Sodium 1-Phenyl, 3-Thiourazole and Ethyl Iodide. 2. A Study of 1, 4-Diphenyl-5-Thiourazole.

Clark, Floyd Barzilia: *The Constitutional Doctrines of Justice Harlan.*

Coleman, A.: *Flaubert's Literary Development in the Light of his Mémoires D'un Fou, Novembre and Education Sentimental (Version of 1845).*

Coolidge, Walter H.: *Osmotic Pressure Measurements of Glucose Solutions at 10° and 20°.*

Deaha, Lucius Junius: *On the Mechanism of Oxime Formation and Hydrolysis and the Use of the Hydrogen Electrode in the Presence of Certain Organic Compounds.*

Dolley, Wm. Lee, Jr.: *Reactions to Light in Vanessa Antiopa, with Special Reference to Circus Movements.*

Goldman, Marcus I.: *The Petrography and Genesis of the Sediments of the Upper Cretaceous of Maryland.*

Gorton, Arthur Feddeman: *Reflection from, and Transmission through, Rough Surfaces.*

Holmes, James Eugene Levering: The Difference in Chemical Behavior of Free and Combined Water as Illustrated by the Saponification of Esters.

Hopkins, Marion Byrd: The Chlorides of Ortho-sulpho-benzoic Acid.

Hubbert, Helen B.: The Effect of Age on Habit Formation in the Albino Rat.

Hulburt, Edward O.: The Reflecting Power of Metals in the Ultra-Violet Region of the Spectrum.

Lashley, K. S.: Inheritance in the Asexual Reproduction of Hydra.

Lloyd, Howard Huntley: A Study of the Conductivity of Certain Organic Acids in Absolute Ethyl Alcohol at 15°, 25° and 35°.

Lubs, Herbert Augustus: I. The Action of Potassium Permanganate upon 1-Phenyl-3-Thiourazole and 1-Phenyl-Thiomethylurazole. II. The Tautomerism of 1-Phenyl-5-Oxy-4, 5 Dihydro-3-Triazolyl Methyl Sulphone. III. The Tautomerism of the Amides.

Middleton, Austin Ralph: Heritable Variations and the Results of Selections in the Fission Rate of *Stylonychia Pustulata*.

Paulus, Max G.: Radiometric Measurements of the Ionization Constants of Methyl Orange and Phenolphthalein.

Pratt, Lyde Stuart: The Esterification of Benzoic Acid by Mercaptans.

Putnam, Willis S.: Part I, The Conductivity and Viscosity of Solutions of Certain Rubidium and Ammonium Salts in Ternary Mixtures of Glycerol, Acetone and Water at 15°, 25°, 35°. Part II. The Conductivity and Viscosity of Solutions of Certain Binary and Ternary Salts in Formamid.

Richards, Annabella E.: The Partial Enzymatic Hydrolysis of Yeast Nucleic Acid^a.

Rogers, Lindsay: The Postal Power of Congress: A Study in Constitutional Expansion.

Schmeisser, Harry C.: Leukæmia of the Fowl: Spontaneous and Experimental.

Sehrt, Edward Henry: Die Formen der Konjunktion und im Westgermanischen.

Shenton, Walter Francis: Linear Combinants of Systems of Binary Forms, with the Syzygies of the Second Degree Connecting Them.

Shive, John W.: A Study of Physiological Balance in Nutrient Media.

Shrader, James Houston: On the Reactions of Both the Ions and the Nonionized Forms of Ethylates and Phenolates with Alkyl Halides.

Sirich, Edward Hinman: A Study in the Syntax of Alexandre Hardy.

Stocking, Ruth Jennings: Variation and Inheritance in Abnormalities occurring after Conjugation in *Paramecium Caudatum*.

Taylor, William A.: I. On the Reaction of Both the Ions and Molecules of Acids, Bases and Salts. On the Reaction of Sodium Ethylate and Methyl Iodide in Absolute Ethyl Alcohol at 0°.

II. A Reinterpretation of the Work of Hecht, Conrad and Bruckner on the Reaction of Alkyl Halides with Sodium Ethylate at Different Temperatures. III. On the Configurations of α and β Glucose. IV. The Equilibrium Between Mucic Acid and Its Lactones.

Twitchell, Mayville W.: The Mesozoic and Cenozoic Echinodermata of the United States.

Wallis, B. Franklin: The Geology and Economic Value of the Wapanucka Limestone of Oklahoma; with Notes on the Economic Value of Adjacent Formations.

Watkins, Charles: Conductivity, Temperature Coefficient of Conductivity and Percentage Dissociation of Some Rather Unusual Salts in Aqueous Solutions.

Wolman, Leo: The Boycott in American Trade Unions.

C. W. DITTRUS,
Secretary, The Johns Hopkins Press.

REPORT OF THE OFFICIAL STATE BUREAUS CONNECTED WITH THE UNIVERSITY

TO THE PRESIDENT OF THE UNIVERSITY:

I submit herewith a report of the official State Bureaus connected with the University and conducted in coöperation with the Geological Department.

THE MARYLAND GEOLOGICAL SURVEY

The Maryland Geological Survey has now been in existence for twenty years, having been established by an Act of the General Assembly in March, 1896. It has been in charge of Professor Clark as State Geologist from the beginning. The appropriation during the first two years amounted to \$10,000 annually. In 1898 a second act was passed providing \$5,000 additional to be used chiefly in the preparation of a base map of the State. Both of these acts have been effective up to the present time as continuing appropriations. By recent legislation enacted all such appropriations, however, cease on October 1, 1916, and beginning on that date the Survey will receive \$14,000 annually for the following two years. The Survey devotes its activities chiefly to geological studies and to the preparation of topographic maps of the State, although consideration is also given independently or in coöperation with other bureaus, both Federal and State, to the study of problems connected with the terrestrial magnetism, hydrography, agricultural soils, and forestry of the State.

The Survey maintained for twelve years, from 1898 to 1910, a Highway Division. During the earlier years of this period the work was largely advisory. A testing laboratory was established and plans and specifications for road and street improvement by the state, county, and municipal authorities were prepared. In 1904 an Act was passed providing for the construction of State Aid roads, \$200,000 annually being appropriated by the State, to be met by an equal amount from the counties, the work to be done under the plans, specifications, and supervision of the State Geological Survey. In 1906, 1908, and 1910, \$384,000 in all were appropriated for the construction, under the auspices of the Geological Survey, of a modern highway from Baltimore to Washington. Altogether over \$1,500,000 were appropriated by the State and counties to be spent under the auspices of the Survey, and over 150 miles of modern roadway were constructed. During this period the various deposits available for road construction throughout the State were tested, as well as the various materials employed on the streets of most of the cities and towns of the State. Much advice in the matter of road and street construction was given to the public officials. In 1910 the highway work of the Survey was transferred to the State Roads Commission, which had been organized in 1908, and of which President Remsen and Professor Clark were members. They continued in this capacity until 1914.

The geological work, which is directly under the charge of the State Geologist and the Assistant State Geologist, Professor Mathews, is divided into three divisions, covering the areas of the Piedmont Plateau, the Appalachian Region, and the Coastal Plain. Investigations are in progress in all these districts and extensive areas in each have already been studied. Reports have already been issued for Allegany, Garrett, Cecil, Calvert, St. Mary's, and Prince George's Counties, while the investigations have been completed for Harford, Anne Arundel, Kent, Queen Anne's, Talbot, Caroline, and Washington Counties. Work is now in progress in Baltimore, Frederick, Carroll, and Howard Counties. In the conduct of the geological work the aid of numerous experts in various parts of the country has been sought, particularly in the study of the several groups of fossil animal and plant remains. Monographs on the Devonian, Lower Cretaceous, Upper Cretaceous, Eocene, Miocene, Pliocene, and Pleistocene deposits of the State have already been published, and similar reports on the Cambrian, Ordovician, Silurian, and Carboniferous are now in preparation. Special economic reports on building stones, clays, coals, limestones, and iron ores have been issued and work is now in progress on the fire clays of Western Maryland and the water resources of the State.

The results of topographical work conducted in coöperation with the United States Geological Survey are presented to the public on the scale of one mile to one inch, either in the form of 15' sheets or in the form of county maps, showing the topography and election districts. They show in a very detailed manner not only the relief of the land but cultural features as well. Maps of all the counties have already been published. A map of Baltimore and vicinity covering 80 square miles on the scale of 1,000 feet to the inch has been issued during the year. Similar maps have been published for the cities of Hagerstown and Cumberland and adjacent areas on the same scale, each map covering 20 square miles.

The investigations in terrestrial magnetism, hydrography, agricultural soils, and forestry have been proceeding as hitherto in coöperation with state and national bureaus. The agricultural soil survey of Montgomery County was completed during the past field season in coöperation with the U. S. Bureau of Soils. The forestry work is now for the most part in charge of the later-organized State Board of Forestry, but the Geological Survey will continue to publish county reports and maps on this subject.

THE MARYLAND WEATHER SERVICE

The Maryland Weather Service has been in existence for twenty-five years, having been organized in May, 1891, under the joint auspices of the Johns Hopkins University, the Maryland Agricultural College, and the United States Weather Bureau. It was established as an official organization by the General Assembly of 1892, the Act being approved by the Governor in April of that year. The State Weather Service under this Act was permanently placed at the Johns Hopkins University, under the direction of a Board of Control nominated by the heads of three institutions above mentioned, who were subsequently commissioned by the Governor. The appropriation for the maintenance of the Bureau has been \$2,000 annually since its establishment, the fund being employed

mainly for investigations relating to the climatology of the State. Professor Clark has been the chief of the Bureau since its organization.

The Weather Service has published, in addition to many small reports and bulletins, three large final volumes, the first dealing with the physiography and meteorology of the State at large, the second with the climate and weather of Baltimore and vicinity, and the third with the distribution of plant life, particularly in its relations to climate and soils.

The Weather Service has taken up, under the direction of Professor Livingston, of the Johns Hopkins University, a quantitative study of the results of climatic factors upon vegetation. By growing various cultivated plants at different stations throughout the State under similar soil conditions and keeping a careful quantitative record of their growth, changes, and physiological activity, it is expected that accurate data will be obtained showing the result of the varying climatic conditions on crop production.

Another important line of work is the study of the rainfall which is being conducted by Dr. Fassig, Chief of the Baltimore office of the United States Weather Bureau. In connection with this and in cooperation with the State Geological Survey and State Department of Health an investigation of the surface and underground water resources of the State is in progress.

THE MARYLAND FORESTRY BUREAU

An Act was passed by the General Assembly of 1906 providing for a State Board of Forestry, to consist of seven members, four of whom are *ex officio* the same as the commissioners of the Geological Survey; the fifth is the State Geologist, while the sixth and seventh are appointed by the Governor.

Professor Clark is the executive officer of the Board and has been authorized by it to see that the provisions of the Act are carried out. Mr. F. W. Besley is the State Forester. Under this Act \$3,500 was appropriated for the first two years and \$4,000 annually for the succeeding four years, while an additional \$1,000 was appropriated by the General Assembly of 1910 to meet the expense of publication of forestry maps. The Legislature of 1912 greatly increased the resources and powers of the State Board of Forestry by appropriating \$10,000 annually for the general expense of the board, besides \$50,000 for the purchase of lands in the valley of the Patapsco River in Baltimore and Howard Counties for a State Reservation, \$8,500 for the purchase of old Fort Frederick and the surrounding lands in Washington County, and \$6,000 for the publication of maps and reports. At the same time provision was made for the establishment of a State Forest Nursery, which is located on land put at the disposal of the Board by the Maryland Agricultural College at College Park. The Legislature of 1914 passed laws, at the suggestion of the Board, providing for the preservation of roadside trees and the planting of shade trees along the highways. At the same time it prohibited the placing of unauthorized signs along the public roads. The administration of these laws is in the hands of the Board. Upon the termination of the present continuing appropriation of \$10,000 annually on October 1, 1916, the General Assembly has provided for the maintenance of the forestry work

for the following two years, the sum of \$14,000 annually, \$5,000 of this amount to be employed each year for fire protection in co-operation with the U. S. Forest Service and \$1,000 for the care of the Patapsco Reservation.

The State Forester and his assistants have prepared plans for more economical forest management of the woodlands of the State and have on request given advice to a large number of owners of wood lots throughout the State. One of the chief aims of the Forestry Board has been the education of the people of the State in matters pertaining to forest management in order that the growing timber of the State may be utilized to the greatest advantage.

CO-OPERATION

Much aid has been rendered the several State bureaus above mentioned by the chiefs of the various Federal bureaus. Particular reference should be made to the coöperation granted by the Director of the United States Geological Survey, the Chief of the United States Coast and Geodetic Survey, the Chief of the United States Weather Bureau, the Chief of the United States Forest Service, Director of the United States Bureau of Mines, and the Chief of the United States Bureau of Soils, all of whom have cordially supplemented the work of the State organizations in many ways. The work of the State organizations is in progress along so many lines that it affords admirable opportunities for the students of the University to obtain much desired practical experience both in the field and in the laboratory; at the same time the State receives much benefit from the trained force of men which is always at its disposal.

WM. BULLOCK CLARK.

REPORT OF THE DIRECTOR OF THE BUREAU OF APPOINTMENTS

TO THE PRESIDENT OF THE UNIVERSITY:

I have the honor to present herewith a report of the activities of the Bureau of Appointments of this University from October, 1915, to October, 1916.

The work of the Bureau has been materially increased over last year, as the appended statistics show. It will be noted that the number of appointments is nowhere near as great as the number of recommendations; but I find on inquiry from the directors of the bureaux of appointment of several other universities that their percentage is even lower than ours. It is also to be remembered that a considerable number of the best men are placed by the personal efforts of the heads of departments and that the Bureau takes the rest. We had during the year a number of applications for recommendations in biology, chemistry, English, mathematics, physics, and Romance languages for which we could make no recommendations, as all of our men in these subjects who were available were placed before April 1.

The number of inquiries from the city for students to do clerical work of various kinds has increased this past year, and the Director is availing himself of every opportunity through the *Alumni Magazine* and by letter and personal conference to get it spread abroad that we have students who are available for part-time and summer-time jobs in the business world.

The practice adopted last year of writing at least one letter each year to every graduate who has been placed through the Bureau has proved its value. Many letters have been received which show the appreciation of the graduates who are out and their willingness to co-operate with the Bureau in helping to place our students, especially in teaching positions.

To this report I append tabular lists of applications, recommendations, and appointments, and the registration in the Bureau. In regard to the list of applications and appointments I may say that applications for men to teach several subjects and the appointments of men to teach several subjects are kept in the file and seem not to merit tabulation.

Bureau of Appointments

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	Applications	Recommendations	App'tm'ts
Teachers	103	56	15
Business	14	22	9
Camp counsellor	1	1	0
Electrician experiment dept..	1	0	0
Dean of women	1	0	0
Electrical engineer	1	1	0
Head of health dept. in public schools	1	0	0
Interpreter	1	1	1
Laboratory worker	1	4	3
Library work	1	6	6
Playground director	1	1	1
Principal	1	0	0
Study hall duty	1	2	2
Resident tutor	2	2	0
Tutor	13	13	13
Summer tutor	4	4	3
Vice-principal	1	1	1
Head educational dept. Y.M.C.A.	1	1	0

	Applications	Appointments
Anatomy	1	0
Biology	6	1
Chemistry	5	1
Civil government	1	0
Education	1	0
English	10	1
French	2	0
Geology	3	0
German	4	0
History	4	1
Latin	1	0
Mathematics	7	2
Modern languages	1	0
Physics	5	1
Political economy	1	0
Psychology	1	0
Romance languages	3	0

REGISTRATION

Undergraduates	17
Graduate students	27
Former students	18
Summer School	3
College Courses for Teachers ..	1
Medical School	1
Unclassified	5
	72
Letters	555
Circulars	176
Telegrams	20
Telephone calls	500

R. V. D. MAGOFFIN,
Director.

REPORT ON THE YOUNG MEN'S CHRISTIAN ASSOCIATION

TO THE PRESIDENT OF THE UNIVERSITY:

For the first time the work of the Young Men's Christian Association has been entirely in the hands of the students. Last spring student officers were elected and a strong cabinet organized. The committee was not able to secure the full-time services of an efficient man in the University, and they therefore asked A. E. Lindley, Inter-collegiate Secretary of the Baltimore City Association, to assume an advisory relationship to the Y. M. C. A., and J. C. Branham was appointed as assistant secretary. Mr. Branham was not able to continue his course of study in the University, and therefore felt it wise to give up his position as an officer in the Association. E. P. Hayes, President of the Association, carried the burden of the work, and much credit for the success of the Association is due to his efforts. The cabinet as a whole has done splendid work, and I take this opportunity to express to you my appreciation of their services. About December 15, R. E. F. Aler was appointed to assume the duties of the assistant secretary, and he proved an efficient man.

New Students

Letters were sent out to all new students about two weeks before the opening of the fall term, telling them of the Association and of its desire to minister to their needs. Boarding house lists were ready, and each out-of-town student was aided in securing good living quarters. Each new student was given a handbook. Handbooks were also distributed among all students, 600 in all. A religious census was taken, and lists of students with church preferences were sent to the pastors of their respective denominations.

The annual opening reception was attended by approximately 400 men. Two other meetings of a social nature were held.

Membership

All men, whether members of the faculty or students, who signed census cards signifying their desire to become members of the Association, were considered so. Members of evangelical churches were considered active members whether they had paid fees or not. All other men enrolled as associate members. This was tried as an experiment. It seems wise with this year's experience to return to the former plan, charging each man a membership fee of \$1.00. Under the above arrangement, we have enrolled during the past year 295 members.

Bible Study

Four classes were organized with an enrollment of 78, and an average attendance of 48. This does not include classes in churches with which we have co-operated. Good interest has been shown.

Missions

Two classes were organized with an enrollment of 43, and an average attendance of 27. 12 men attended the State Missionary Conference held at Westminster.

Meetings

Chapel has been conducted each morning with good interest. The leaders have been the strongest we could get. The faculty and ministers of the city have co-operated with us in this work.

	No. of Meetings	Av. Atten.	Total
Chapel	120	22	2640
Special Meetings.....	5	164	820
	<u>125</u>		<u>3460</u>

The Association being unable to find any traces of a Constitution of the Y. M. C. A., adopted at their annual business meeting a Constitution which had been agreed upon by both the members of the Association and the existing advisory members of the faculty. This Constitution provides for an Advisory Board, and the following were elected as members:

Frank J. Goodnow	}	for a term of three years.
Eugene Levering		
R. V. D. Magoffin, <i>Chairman</i>		
Murray P. Brush	}	for a term of two years.
C. J. Tilden, <i>Secretary</i>		
John McDowell		
John R. Sutton	}	for a term of one year.
Elbert Russell		
John A. Addison		

The following officers were elected:

Paul W. Sutton, President; A. K. Chalmers, Vice-President; R. G. Hoffman, Recording Secretary; H. E. Kirk, Jr., Corresponding Secretary; W. L. Taylor, Treasurer.

Finances

The expenditures for the year, including salaries, printing, stenographic work, and current miscellany amounted to \$754.96; the receipts were \$953.28, which included the University appropriation, contributions from the members of the Faculty, the Students, Alumni, and business men, and payments for advertising in the Handbook.

ALVA E. LINDLEY,
General Secretary.

DEGREES CONFERRED, 1915-16

DOCTOR OF PHILOSOPHY

WILLIAM FOXWELL ALBRIGHT, of Beach, Va., A. B., Upper Iowa University, 1912. *Subjects:* Assyrian, Arabic, and History of the Ancient East. *Dissertation:* The Assyrian Deluge Epic. *Referees on Dissertation:* Professors Haupt and Ember.

JOHN MILTON BLOCHER, JR., of Gettysburg, Pa., S. B., Pennsylvania College, 1913. *Subjects:* Chemistry, Physical Chemistry, and Mineralogy. *Dissertation:* Osmotic Pressure Measurements of Levulose Solutions at Thirty Degrees. *Referees on Dissertation:* Professors Morse and Frazer.

WILLIAM NORMAN BROWN, of Baltimore, A. B., Johns Hopkins University, 1912. *Subjects:* Sanskrit, Arabic, and History of the Ancient East. *Dissertation:* The Pāricatantra in Modern Indian Folklore. *Referees on Dissertation:* Professors Bloomfield and Collitz.

WILLIAM STEPHEN BROWN, of Washington, D. C., E. E., Rensselaer Polytechnic Institute, 1913. *Subjects:* Electrical Engineering, Physics, and Mathematics. *Dissertation:* The Electric Strength of Air at Atmospheric Pressure under Alternating and Continuous Potentials. *Referees on Dissertation:* Professors Whitehead and Ames.

JOHN MARVIN BURTON, of Culpeper, Va., A. B., Randolph-Macon College, 1909. *Subjects:* French, Spanish, and Italian. *Dissertation:* Honoré de Balzac and his Figures of Speech. *Referees on Dissertation:* Professor Armstrong and Mr. Carcassonne.

EDWARD PERRY CHURCHILL, of Allerton, Iowa, A. B., Iowa State University, 1907. *Subjects:* Zoölogy, Psychology, and Physical Chemistry. *Dissertation:* The Absorption of Nutriment from Solution by Freshwater Mussels. *Referees on Dissertation:* Professors Jennings and Grave.

GERALD CHARLES CONNOLLY, of Baltimore, A. B., Rock Hill College, 1912. *Subjects:* Chemistry, Physical Chemistry, and Physics. *Dissertation:* The Difference in Chemical Activity of Free and Semi-combined Water as Illustrated by the Effect of Neutral Salts on the Hydrolysis of Acetic Anhydride. *Referees on Dissertation:* Professors Frazer and Morse.

ROBERT WILLIAM DICKEY, of Covington, Va., S. B., Washington and Lee University, 1910, and A. B., 1911. *Subjects:* Physics, Applied Electricity, and Astronomy. *Dissertation:* The Application of the Plane Grating to the Determination of the Index of Refraction of a Gas with Values for Air from $\lambda 2500$ to $\lambda 6500$. *Referees on Dissertation:* Professors Ames and Anderson.

LLEWELLYN GRIFFITH HOXTON, of the University of Virginia, A. B., B. S., M. A., University of Virginia, 1900. *Subjects:* Physics, Mathe-

matics, and Geological Physics. *Dissertation*: The Joule-Thomson Effect for Air at Moderate Temperatures and Pressures. *Referees on Dissertation*: Professors Ames and R. W. Wood.

JOHN FOSTER HUTCHINSON, of Ferguson, S. C., S. B., South Carolina Military College, 1913; A. M., College of Charleston, 1914. *Subjects*: Chemistry, Physical Chemistry, and Mineralogy. *Dissertation*: The Absorption Coefficient of Solutions of Cobalt Chloride in Water and Various Alcohols for Monochromatic Radiation. *Referees on Dissertation*: Professors Frazer and Morse.

BUFORD JENNETTE JOHNSON, of Thomson, Ga., A. B., La Grange College, 1905; A. M., Johns Hopkins University, 1915. *Subjects*: Education, Psychology, and Mathematics. *Dissertation*: Experimental Study of the Motor Abilities of Children in the Primary Grades. *Referees on Dissertation*: Professors Buchner and Dunlap.

CALEB GUYER KELLY, of Baltimore, A. B., Johns Hopkins University, 1908. *Subjects*: History, Political Science, and Philosophy. *Dissertation*: French Protestantism, 1559-1562. *Referees on Dissertation*: Professors Vincent and Latané.

JOHN WILLARD KIMBALL, of Moodus, Conn., S. B., Colby College, 1912. *Subjects*: Chemistry, Physical Chemistry, and Applied Electricity. *Dissertation*: The Esterification of Benzoic Acid by Isomeric Butyl Mercaptans. *Referees on Dissertation*: Professors E. E. Reid and Lovelace.

MARIE LORETTO LILLY, of Baltimore, A. B., Notre Dame College (Md.), 1900; A. M., Johns Hopkins University, 1914. *Subjects*: English, History, and Philosophy. *Dissertation*: The Georgic: A Preliminary Study of the Vergilian Type of Didactic Poetry. *Referees on Dissertation*: Professors Bright, Mustard, and Shaw.

MILDRED WEST LORING, of Seattle, Wash., A. B., University of Washington, 1912. *Subjects*: Psychology, Physiology, and Psychiatry. *Dissertation*: Methods of Studying Controlled Word Associations. *Referees on Dissertation*: Professors Jennings and Dunlap.

PAUL D. MARKEL, of Union Bridge, Md., S. B., Pennsylvania College, 1913. *Subjects*: Chemistry, Physical Chemistry, and Mineralogy. *Dissertation*: The Transposition of Esters and the Interdependence of Limits. *Referees on Dissertation*: Professors E. E. Reid and Lovelace.

ARTHUR GILLET McCALL, of Columbus, Ohio, B. Sc., Ohio State University, 1900. *Subjects*: Plant Physiology, Physical Chemistry, and Genetics. *Dissertation*: The Physiological Balance of Nutrient Solutions for Plants in Sand Cultures. *Referees on Dissertation*: Professors Livingston and Frazer.

ARTHUR CHESTER MILLSPAUGH, of Augusta, Mich., A. B., Albion College, 1908; A. M., University of Illinois, 1910. *Subjects*: Political Science, History, and Political Economy. *Dissertation*: Party Organization and Machinery in Michigan since 1890. *Referees on Dissertation*: Professors Willoughby and Latané.

KOKICHI MORIMOTO, of Sapporo, Japan, Imperial College of Sapporo, 1901. *Subjects*: Political Economy, History, and Political Science. *Dissertation*: A Study of the Standard of Living in Japan. *Referees on Dissertation*: Professors Hollander and Barnett.

FRANCIS DOMINIO MURNAGHAN, of Omagh, Ireland, A. B., National University of Ireland, 1913, and A. M., 1914. *Subjects*: Mathematics, Physics, and Celestial Mechanics. *Dissertation*: The Lines of Electric Force due to a Moving Electron. *Referees on Dissertation*: Professor Morley and Dr. Bateman.

JOHN ROGERS MUSSELMAN, of Gettysburg, Pa., A. B., Pennsylvania College, 1910. *Subjects*: Mathematics, Physics, and Astronomy. *Dissertation*: A Set of Eight Self-associated Points in Space. *Referees on Dissertation*: Professors Morley and Coble.

RAYMOND THOMPSON MYRICK, of Richmond, Ind., S. B., Earlham College, 1912. *Subjects*: Chemistry, Physical Chemistry, and Mineralogy. *Dissertation*: A Study of the Osmotic Pressures of Concentrated Solutions of Sucrose with a Resistance Pressure Gauge. *Referees on Dissertation*: Professors Morse and Frazer.

GEORGE FREDERICK ORDEMAN, of Frederick, Md., S. B., Washington and Lee University, 1912. *Subjects*: Chemistry, Physical Chemistry, and Mineralogy. *Dissertation*: A Study of the Dissociating Powers of Free and of Combined Water. *Referees on Dissertation*: Professors Frazer and Morse.

OSCAR LEE OWENS, of Baltimore, A. B., Richmond College, 1898; A. M., Johns Hopkins University, 1913. *Subjects*: Political Science, English, and History. *Dissertation*: Earlier Diplomatic Negotiations of the United States in Matters relating to Religion. *Referees on Dissertation*: Professors Willoughby and Latané.

ARTHUR MCCAY PARDEE, of Tarkio, Mo., A. B., Washington and Jefferson College, 1907. *Subject*: Chemistry, Physical Chemistry, and Geology. *Dissertation*: A Study of the Conductivity of Certain Organic Salts in Absolute Ethyl Alcohol at 15°, 25°, and 35°. *Referees on Dissertation*: Professors Frazer and Morse.

CHARLES HENRY RAWLINS, JR., of Bridgeville, Del., Ph. B., Dickinson College, 1910, and A. M., 1913. *Subjects*: Mathematics, Astronomy, and Physics. *Dissertation*: Complete Systems of Concomitants of the Three-Point and the Four-Point in Elementary Geometry. *Referees on Dissertation*: Professors Morley and Cohen.

FRANK REEVES, of Fairmont, W. Va., A. B., West Virginia University, 1911. *Subjects*: Geology, Mineralogy, and Physical Chemistry. *Dissertation*: A Discussion of the Absence of Water in Certain Petroleum-bearing Strata of the Appalachian Oil Fields. *Referees on Dissertation*: Professors Clark and Mathews.

THOMAS DECOURSEY RUTH, of Roland Park, Md., A. B., Johns Hopkins University, 1906. *Subjects*: Latin, Greek, and Sanskrit. *Dissertation*: The Problem of Claudius: Some Aspects of a Character Study. *Referees on Dissertation*: Professors Smith and Mustard.

JOHN HARRISON SACHS, of Gettysburg, Pa., S. B., Pennsylvania College, 1910. *Subjects*: Chemistry, Physical Chemistry, and Mineralogy. *Dissertation*: The Esterification of Ortho, Meta, and Para Toluic Acids with Ethyl Mercaptan. *Referees on Dissertation*: Professors E. E. Reid and Lovelace.

DAVID PAUL SMELSER, JR., of Baltimore, A. B., New Windsor College, 1912. *Subjects*: Political Economy, Political Science, and

Mathematics. *Dissertation:* Unemployment and American Trade Unions. *Referees on Dissertation:* Professors Hollander and Barnett.

ADOLF LUDWIG TAYLOR STABOCK, of Baltimore, A. B., Johns Hopkins University, 1911. *Subjects:* German Literature, Germanic Philology, and Sanskrit. *Dissertation:* Der Alraun: Ein Beitrag zur Pflanzen-sagenkunde. *Referees on Dissertation:* Professors H. Wood and Collitz.

REUBEN STEINBACH, of Baltimore, A. B., Johns Hopkins University, 1913. *Subjects:* Hebrew, Arabic, and Egyptology. *Dissertation:* The Book of Obadiah. *Referees on Dissertation:* Professors Haupt and Ember.

JOSEPH NOBLE STOCKETT, JR., of Baltimore, A. B., Johns Hopkins University, 1911. *Subjects:* Political Economy, Political Science, and History. *Dissertation:* The Arbitral Determination of Wages. *Referees on Dissertation:* Professors Hollander and Barnett.

GEORGE DUDLEY VAN EPPS, of Atlanta, Ga., S. B., Georgia School of Technology, 1913. *Subjects:* Chemistry, Physical Chemistry, and Mineralogy. *Dissertation:* I. Preparation of Nitriles. II. Catalytic Preparation of Nitriles. *Referees on Dissertation:* Professors E. E. Reid and Lovelace.

DAVID EMBICH WEGLEIN, of Baltimore, A. B., Johns Hopkins University, 1897; A. M., Columbia University, 1912. *Subjects:* Education, Psychology, and Mathematics. *Dissertation:* The Correlation of Abilities of High School Pupils. *Referees on Dissertation:* Professors Buchner and Watson.

WENDELL PHILLIPS WOODRING, of Myerstown, Pa., A. B., Albright College, 1910. *Subjects:* Geology, Paleontology, and Physical Chemistry. *Dissertation:* The Mollusca of the Bowden Beds of Jamaica. *Referees on Dissertation:* Professors Clark and Berry.

BENJAMIN BLACKISTON WROTH, of Chestertown, Md., A. B., Washington College, 1908. *Subjects:* Chemistry, Physical Chemistry, and Physics. *Dissertation:* A Study of the Solubilities of Liquids in Liquids. The Partition of the Lower Alcohols between Water and Cottonseed Oil. *Referees on Dissertation:* Professors E. E. Reid and Lovelace.

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DOCTORS OF MEDICINE

WILLIAM WILLIS ANDERSON, of Baltimore, A. B., University of Georgia, 1911.

HERMAN S. APPLEBAUM, of Baltimore, A. B., Johns Hopkins University, 1912.

EMILY PARTRIDGE BACON, of Moorestown, N. J., A. B., Wilson College, 1912.

IRVIN C. BARCLAY, of Macomb, Ill., S. B., Knox College, 1912.

BRYAN ANDERSON BARLOW, of Ashford, Ala., S. B., University of Alabama, 1912.

HAROLD CEDRIC BEAN, of Portland, Ore., A. B., University of Oregon, 1912.

PIO BLANCO, of San Juan, P. R., S. B., Washington and Jefferson College, 1912.

SAM BROCK, of Carrollton, Ga., A. B., University of Georgia, 1911.

H. HAYS BULLARD, of Baltimore, A. B., University of Missouri, 1908; Ph. D., Tulane University, 1912.

HARRY J. BURKHOLDER, of Monmouth, Ill., S. B., Monmouth College, 1912.

JOHN JOSEPH CARDEN, of Honolulu, H. I., S. B., University of California, 1912.

JAMES JULIAN CHISOLM, of Natchez, Miss., A. B., Princeton University, 1911.

PAUL WILLIAM CHRISTMAN, of Berkeley, Cal., S. B., University of California, 1912.

SEYMOUR GARLAND CLARK, of Darien, Ga., Ph. B., Emory College, 1912.

HENRY BROWN CONRAD, of Winston-Salem, N. C., A. B., Wake Forest College, 1912.

WILLIAM WALTER CUMMINGS, of Providence, R. I., A. B., Brown University, 1912.

FRANK IRONS DARROW, of Fargo, N. Dak., S. B., North Dakota Agricultural College, 1912.

HAROLD BALL DISBROW, of Lakewood, N. J., A. B., Princeton University, 1911.

JOSEPH PUGH EDSON, of Eaton, Ohio, A. B., Miami University, 1912.

REUBEN JOHAN ERICKSON, of Galesburg, Ill., A. B., Knox College, 1911.

JAMES ALLAN ETHERIDGE, of Macon, Ga., A. B., University of Georgia, 1912.

RUTH ELDRED FAIRBANK, of Jacksonville, Ill., A. B., Illinois College, 1911.

LLOYD DEBB FELTON, of Magnolia, Ohio, A. B., Wooster University, 1910.

ROY LAMAR FIELDER, of Spring Valley, Va., A. B. and S. B., Emory and Henry College, 1912.

WILLIAM PARKER FINNEY, JR., of Lincoln University, Pa., A. B., Princeton University, 1908.

ROBERT GUY FULLER, of Baton Rouge, La., S. B., Louisiana State University, 1907.

HUGH CLINTON FISCHE GILL, of Baltimore, S. B., Maryland Agricultural College, 1912.

ADOLPHUS BARTE GREENWOOD, of Asheville, N. C., A. B., University of North Carolina, 1910.

WALTER EDWARD GREMPLE, of Baltimore, A. B., Johns Hopkins University, 1912.

FERDINAND HERBERT HAESSLER, of Milwaukee, Wis., A. B., University of Wisconsin, 1914.

DAVID HORACE HALLOCK, of Southampton, N. Y., A. B., Hamilton College, 1912.

HOWARD HARRISON HAMMAN, of Greensburg, Pa., S. B., Allegheny College, 1912.

MARGARET IRVING HANDY, of Smyrna, Del., A. B., Goucher College, 1911.

CHARLES MAXWELL HARMON, of Cassopolis, Mich., A. B., Lake Forest College, 1912.

JOHN WARTON HARRIS, of Reidsville, N. C., A. B., University of North Carolina, 1911.

GEORGE ARGALE HARROP, JR., of South Bend, Ind., A. B., Harvard University, 1912.

THOMAS JOHANNES HELDT, of Columbia, Mo., A. B., University of Missouri, 1910.

FREDERICK KARL HERFEL, of Reynoldsville, Pa., A. B., Allegheny College, 1912.

ELIJAH MAXIE HICKS, JR., of Coward, S. C., A. B., Furman University, 1912.

ROBERT CARHART HOOD, of Clarksburg, W. Va., A. B., Washington and Lee University, 1912.

JACK MASON HUNDLEY, of Baltimore, A. B., St. John's College, 1912.

MILDRED JENKS, of Boston, Mass., A. B., Wellesley College, 1911.

ARTHUR LYMAN KINNE, of Holyoke, Mass., A. B., Dartmouth College, 1912.

JOSEPH SELL LAWRENCE, of York, Pa., A. B., Franklin and Marshall College, 1904.

HUGH FRANCIS LENA, of Lawrence, Mass., A. B., Dartmouth College, 1912.

ASA LIGGETT LINCOLN, of Lacey Spring, Va., A. B., Elon College, 1910.

JOHN GABRIEL LONG, of Lancaster, Pa., A. B., Franklin and Marshall College, 1912.

IRVING KENNEDY LOVETT, of Little Silver, N. J., Ph. B., Lafayette College, 1912.

LAWRENCE KINSMAN McCAFFERTY, of Columbus, Ohio, A. B., Kenyon College, 1912.

CHARLES LEE MCCARTHY, of Princeton, N. J., S. B., Princeton University, 1912.

PATRICK FRANCIS MCGUIRE, of Baltimore, A. B., Rock Hill College, 1909.

EDITH HELEN MAAS, of New York, N. Y., A. B., Vassar College, 1912.

RICHARD S. MAJOR, of Johnsonville, S. C., A. B., Wofford College, 1909.

WALTER BRAMBLETTIE MARTIN, of Norfolk, Va., S. B., Virginia Polytechnic Institute, 1909.

MILO KIRK MILLER, of Urbana, Ill., A. B., University of Illinois, 1912.

WILLIAM THOMAS MITCHELL, JR., of Pittsburgh, Pa., S. B., University of Pittsburgh, 1912.

JOSEPH EARLE MOORE, of Kansas City, Mo., A. B., University of Kansas, 1914.

JOHN HENRY MULLIN, of Wilmington, Del., S. B., Princeton University, 1912.

DAVID REID MURCHISON, of Wilmington, N. C., A. B., University of North Carolina, 1912.

ALFRED PFITSCH, JR., of Baltimore, A. B., Western Maryland College, 1912.

CHARLES BERNARD PRITCHETT, of Danville, Va., A. B., Washington and Lee University, 1912.

SIDNEY O. REESE, JR., of Randolph, Neb., S. B., University of Nebraska, 1913, and Medical Department, 1911-13.

HORACE WITHERS REID, of Danville, Ky., A. B., Central University of Kentucky, 1911.

FRED DAWSON REYNOLDS, of Brundidge, Ala., S. B., University of Alabama, 1912.

LAWRENCE REYNOLDS, of Ozark, Ala., A. B., University of Alabama, 1912.

FRANCIS ERRETT ROBERTS, of Moundsville, W. Va., A. B., Bethany College, 1912.

CHARLES EDWIN SEVIER, of Brownsville, Tenn., S. B., Vanderbilt University, 1912.

JOHN ALSTON SEVIER, of Brownsville, Tenn., S. B., Vanderbilt University, 1912.

DANIEL GLEN SMITH, of Schenectady, N. Y., S. B., Union College, 1912.

TAYLOR BIVENS SMITH, of Caldwell, Ohio, A. B., Marietta College, 1912.

WILLIAM WHITE SOUTHARD, of Redlands, Cal., A. B., Leland Stanford, Jr. University, 1910.

JAMES SPENCE SPEED, of Roanoke, Va., A. B., University of Virginia, 1912.

RICHARD ERNEST STIFEL, of Pittsburgh, Pa., A. B., Harvard University, 1912.

JAMES KENT STODDARD, of Mt. Holly, N. J., A. B., Princeton University, 1912.

ALAN CALLENDER SUTTON, of Baltimore, A. B., Johns Hopkins University, 1912.

THOMAS LYNN SUTTON, of Zanesville, Ohio, A. B., University of Michigan, 1912.

HENRY M. THOMAS, JR., of Baltimore, S. B., Haverford College, 1912.

JUNIUS ERNEST WARINNER, JR., of Richmond, Va., A. B., Richmond College, 1912.

THEODORA WHEELER, of Fairfield, Conn., A. B., Vassar College, 1911.

SAMUEL AUGUSTUS WHITE, of Savannah, Ga., S. B., University of South Carolina, 1912.

GEORGE BERNAYS WISLOOKI, of St. Louis, Mo., A. B., Washington University, 1912.

ERNEST LUDWIG ZIMMERMAN, of New Bedford, Mass., A. B., Dartmouth College, 1912.

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MASTER OF ARTS

GRACE BAGNALL BRANHAM, of Baltimore, A. B., Bryn Mawr College, 1910. *Subject*: English. *Essay*: The Metaphysical Group in English Poetry. *Referees on Essay*: Professors Bright and Lovejoy.

SAMUEL MOSES BURKA, of Baltimore, A. B., Johns Hopkins University, 1913. *Subject*: Physics. *Essay*: Radio-Active Atoms. *Referees on Essay*: Professors Ames and Pfund.

MASUYO CHINDA, of Tokyo, Japan, A. B., Meija University, 1913. *Subject*: Political Economy. *Essay*: The Payment of International Balance between Japan and the United States with Reference to the Banking Agency and Exchange Mechanism. *Referees on Essay*: Professors Hollander and Barnett.

EARL LEVERNE CRUM, of Athens, Pa., A. B., St. John's College, 1913. *Subject*: Latin. *Essay*: Uses of the Image in Magic. *Referees on Essay*: Professors Smith and Mustard.

RAY HARBAUGH DOTTERER, of Baltimore, Ph. B., Franklin and Marshall College, 1906. *Subject*: Philosophy. *Essay*: The Philosophy of the 'As If' in its Application to Theology. *Referees on Essay*: Professors Lovejoy and Dunlap.

HINDA TEAGUE HILL, of Greensboro, N. C., A. B., and L. I., University of Nashville (Peabody College for Teachers), 1903. *Subject*: French. *Essay*: A Study of Rhyme Words in the Roman de la Rose. *Referees on Essay*: Professors Armstrong and Marden.

ELIZABETH FRENCH JOHNSON, of Manassas, Va., A. B., Goucher College, 1911. *Subject*: German Literature. *Essay*: The Eclogues of Georg Rudolf Weckherlin. *Referees on Essay*: Professors H. Wood and Mustard.

FRED LOOMIS MOHLER, of Carlisle, Pa., A. B., Dickinson College, 1914. *Subject*: Physics. *Essay*: Properties of Matter at the Critical Point. *Referees on Essay*: Professors Ames and R. W. Wood.

CATHRYN VEDALLA RILEY, of Washington, D. C., A. B., Wellesley College, 1912. *Subject*: Bacteriology. *Essay*: Observations on the Air Microorganisms in Baltimore. *Referees on Essay*: Professors Ford and Howell.

CARL SCHARF, of Baltimore, A. B., Johns Hopkins University, 1914. *Subject*: German Literature. *Essay*: Wieland's "Don Sylvio von Rosalba": The Passage from Pietism to Naturalism in the Author's Development. *Referees on Essay*: Professors H. Wood and Collitz.

PHILIP LOUIS SYKES, of Baltimore, A. B., Johns Hopkins University, 1908; LL. B., University of Maryland, 1911. *Subject*: Political Science. *Essay*: Public Use in Eminent Domain and Taxation. *Referees on Essay*: Professors Willoughby and Latané.

VIVIAN VOSS, of Pretoria, S. Africa, A. B., Transvaal University College, 1913. *Subject*: Physics. *Essay*: The Theory of Specific Heats. *Referees on Essay*: Professors Ames and R. W. Wood.

ALFRED MILES WITHERS, of Abingdon, Va., A. B., Washington and Lee University, 1906. *Subject*: French. *Essay*: The Influence of Seneca's Hippiolytus on the Phèdre of Racine. *Referees on Essay*: Professors Armstrong and Terracher.

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BACHELOR OF ARTS

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JOHNS HOPKINS UNIVERSITY CIRCULAR, No. 291

JANUARY, 1917

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ANNUAL REPORT
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1916-17



BALTIMORE
THE JOHNS HOPKINS PRESS
1917

JOHNS HOPKINS UNIVERSITY CIRCULAR, No. 291

JANUARY, 1917

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No. 10

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THE
JOHNS HOPKINS
UNIVERSITY CIRCULAR

EDITED BY

THOMAS R. BALL

REPORT OF THE PRESIDENT
OF THE UNIVERSITY
1916-17

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ANNUAL REPORT
OF
THE PRESIDENT OF
THE JOHNS HOPKINS UNIVERSITY

1916-17



BALTIMORE
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1917

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New Series, 1917, No. 10

DECEMBER, 1917

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ANNUAL REPORT OF THE PRESIDENT

TO THE TRUSTEES OF THE JOHNS HOPKINS UNIVERSITY:—

Gentlemen:

I have the honor to submit to you my annual report as President of the University for the academic year ending September 30, 1917. Attached hereto are the reports from the different departments of the University, which contain a statement both of the work done during the year and of some of our most pressing needs.

The year that has just closed will be memorable in the annals of the University for several reasons. In the first place the past year was the first year during which the work of the Philosophical Faculty was carried on at Homewood. Our year's experience has shown that the move to Homewood at the time determined was amply justified, although some departments have suffered a certain amount of inconvenience. This is particularly true of the department of Zoölogy. It is to be hoped that in the near future better quarters may be provided for this department. In the meantime, however, its members have endeavored with commendable cheerfulness to adjust themselves to the new conditions

and the work has not suffered. The disadvantages due to cramped and inadequate quarters have been offset by greater facilities for work due to the existence of small ponds on the grounds, where experiments impossible at the old site have been carried on.

The conditions of the department of Chemistry have been much more favorable than was anticipated when it was decided to move to the new site. The generosity of Mr. J. E. Aldred, of New York City, enabled us to equip an undergraduate chemical laboratory in the basement of the south wing of the Mechanical and Electrical Engineering Building. The result has been that all the undergraduate work in chemistry has been carried on during the past year at Homewood. The centralization of this work has been of great advantage, not only because of considerations of convenience to our undergraduate students, but also because it has freed much room in the old chemical laboratory which was sorely needed for the purposes of graduate work.

The wisdom of the move to Homewood was shown especially in the large freshman class which entered at the beginning of the year. For the first time in the history of the University the number of freshmen exceeded one hundred and fifty.

The year that has just closed was notable also for the inauguration of evening courses. The University had for a number of years made provision for courses in the late afternoon, which were particularly designed for teachers desiring to render themselves better prepared for their work in the schools. Owing to the generosity of friends of the University in the city of Baltimore, it became possible to offer during the past year to the people of the city two sets of evening courses, viz., the Courses in Business Economics and the Courses for Technical Workers. The attempt was made further to add considerably to the work done in the College Courses for Teachers, some of which also were given in the evening.

The registration in these late afternoon and evening courses, which amounted to more than eleven hundred, was conclusive

proof that evening courses of a varied but systematic character were needed in the city. Up to the time the University determined to undertake this work there was practically no place in Baltimore where those who had finished their schooling and had begun the task of earning their living could go for further needed instruction. It was this consideration that determined the University authorities to undertake the work as soon as the necessary resources were provided. A number of far-seeing men in the city were convinced that the changes in the economic life of Baltimore, due to the increase in the number of industrial enterprises which were being established in the neighborhood, made it absolutely necessary that such evening classes should be started, and offered to assist the University in taking the step.

The past year has, finally, been memorable because of the entrance of this country into the great world war which has been waged during the last three years. Prior to the entrance of the United States into the struggle, the University determined to organize, under the National Defense Act of 1916, a Reserve Officers' Training Corps Unit. The approval of the War Department was secured in the summer of 1916, and the University opened its academic year in October, 1916, with a fully organized infantry battalion under the command of Captain C. W. Elliott, U. S. A., detailed here as Professor of Military Science and Tactics by the War Department.

It is the belief of all those who have observed the year's work that, apart entirely from the service which such instruction may be to the country in this great crisis in its life, the military instruction which has been given has had the most salutary effect upon the student body. The work was carried on with enthusiasm and was commented upon most favorably by the officer sent by the War Department to inspect it.

It was, however, particularly fortunate that the University determined to include military instruction in its curriculum at so early a date. For the instruction given enabled a large number of our older students to go to the Officers' Training

Camps established last spring, with a preparation which was invaluable to them in the work undertaken in those camps.

The call to arms to which the college men of this land responded so generally last spring has necessarily had serious effects on our institutional life. Many members of our Faculty and many former students are now serving their country in the military services. Others have entered some one of the civil services. The result is that we shall open the coming year short-handed so far as concerns our teaching force, and with a considerably smaller number of students than we should have had the right to expect in normal times.

The Medical Faculty has suffered greater losses in this respect than the other faculties of the University. Sixty of the members of this faculty and of the hospital staff have entered the medical services of the United States Government. At the same time there is no faculty some of whose members are not now in the service of their country. The greater loss of the Medical Faculty is due, of course, to the organization of the Hopkins Hospital Unit now "somewhere in France." In addition to the hospital unit, there was organized also the Hopkins Ambulance Unit which, with other units of the same character, has been spending the summer in training.

Either members of the faculty or former students are to be found at the present time in the Navy, the Regular and National Armies, the National Guard, or in the civilian bureaus of the United States Government.

Finally, at the University itself considerable work has been carried on at the request of the Government. Of this character of work was the organization, under the Shipping Board, of day and evening Schools of Navigation and Marine Engineering for the education of deck and engine-room officers for the ships of the new Mercantile Marine which the Shipping Board is constructing. Already more than fifty men have been sent from these schools into the American Mercantile Marine.

In addition to these schools much work has been done in the laboratories of the University at the request of the Gov-

ernment. I may say, indeed, that there has been no call made upon us by the Government, either for the services of our instructors or for the use of our equipment, to which the University has not responded. In some cases departments have been closed and work in them discontinued in order to meet the calls made upon us.

I have mentioned these things only as an indication of the willingness of the University to do what it can for the country at this time. We all wish that our facilities were such that we might do more than we have been able to do. The fact that we have no dormitories has necessarily greatly circumscribed the character of the work which we can do. For so many of the schools which have been opened by the Government at the various universities have used the university dormitories and commons for housing and feeding the students in those schools.

MEDICAL SCHOOL

The most important happening in the Medical School during the past year was the resignation by Dr. Welch of the Professorship of Pathology which he has filled with such distinction since its establishment. Dr. Welch's resignation was due to his acceptance of the Directorship of the recently organized School of Hygiene and Public Health. The vacancy caused by Dr. Welch's resignation was filled by the appointment of Dr. William George MacCallum, Professor of Pathology in Columbia University, a graduate of the first class in our Medical School and afterwards a member of its Faculty.

Owing to a generous gift from the General Education Board, it has been possible to strengthen considerably the work of the department of Pediatrics, as well as that of a number of the laboratory departments in the Medical School, including the department of Pathology.

THE ENGINEERING SCHOOL

The most notable event in the Engineering School was the gift by Mr. J. E. Aldred, of New York City, of funds for

furthering and improving undergraduate instruction in the methods and problems of engineering practice. With the funds so generously given we were able to make provision for a series of lectures on some of the practical problems which are presented to the engineer for solution. The lectures were given by men of eminence in their particular lines, who, at the same time, were engaged in practical work, and they were of great interest and value to our engineering students. These lectures were subsequently published by the University Press as "The J. E. Aldred Lectures on Engineering Practice."

THE SCHOOL OF HYGIENE AND PUBLIC HEALTH

Progress has been made in the organization of the faculty of this school, as well as in providing quarters in which the work may be carried on. Professor Elmer V. McCollum, of the University of Wisconsin, was called to fill the chair of Chemistry, and he began his work in July in temporary quarters in the basement of the physiological building. Land for the new building has been purchased at Monument and Wolfe streets and plans for the building have been decided upon. The school will, however, open next October for its first year of work in the old Physical Laboratory on West Monument street, which will be fitted up for this purpose. It was felt that it would be unwise for us to delay the opening of the school until the completion of the new building, as war conditions made it impossible to anticipate with any certainty the time of completion of any new work which might be undertaken.

THE SUMMER COURSES

The usual courses were given during the past summer. Notwithstanding the fact that a greater number and variety of courses were offered, the attendance was less than the summer before, evidently due to the effect which the existence of the war is having upon our educational institutions. A feature of the summer courses was the coöperative arrangement made with the Maryland Institute. By this arrangement the

summer art courses of the Institute were made a part of the work of the University and given at Homewood.

NEEDS OF THE UNIVERSITY

The most pressing need of the University is the same to which attention was called in my last report. That is an increase in the endowment applicable to general purposes. This increased endowment is necessary in the first place to make it possible for us to carry on our work on its present scale without a continually recurring deficit, and second to provide for necessary salary increases.

On the other hand salary increases are now even more imperative than ever, because of the continual increase in the cost of living. If we cannot in some measure meet this increase, we may not be able to keep with us some of the most valuable members of our teaching force.

We need, of course, some new buildings to do our work in the most effective manner. We can, however, for the present do without them, if absolutely necessary. But we must have greater resources if we are to continue to do even the work we are now doing, which is chargeable to our general funds.

FINANCIAL STATEMENT

The Financial Report, showing in detail the operations for the year ending June 30, 1917, and the condition of the University finances on that date, has been published, and copies may be obtained from the Treasurer by those interested. Reference to this report will reveal the following facts:

The operations of the year resulted in an		
excess * of expenditures over ordinary in-		
come of		\$69,692.12
On Philosophical and Collegiate account...	\$33,120.51	
and on Medical School Account.....	36,571.61	

* Covered by Hopkins Maintenance Fund for 1916-17 of \$70,000.00.

The excess for the preceding year was.....	71,925.59
For Philosophical and Collegiate Departments	\$43,368.95
For the Medical School.....	28,556.64
	<hr/>
A decrease this year of.....	\$2,233.47
It will be noted that the deficit on the Philosophical and Collegiate account decreased during the year as compared with the year before.....	10,248.44
And the deficit in the Medical School increased	8,014.97
	<hr/>
Making a net decrease as above of.....	2,233.47
	<hr/>
The total income from operations for the year was....	\$709,315.89
An increase this year of.....	143,616.39

This increase came from the following sources:

Tuition	\$14,489.43
Other items, of which \$17,616.60 is accounted for by a consideration for the first time in the receipts of the Carnegie Allowances, and \$20,201.00 by the receipts from the Courses in Business Economics and the Night Courses for Technical Workers, these courses having been started in 1916-17	\$59,126.96
Hopkins Maintenance Fund.	\$70,000.00

Of the total income, the amount received from students was 20 per cent., the income from invested funds 44 per cent., from the State of Maryland 10 per cent. and from other items 26 per cent.

The total operating expenses for the year were..... \$709,008.01

A net increase for the year of..... \$71,382.92

The increase is accounted for as follows:

In salaries.....	\$43,049.52
In expenses.....	30,108.43
	<hr/>
	\$73,157.95
Less decrease in apparatus and books	1,775.03
	<hr/>
	\$71,382.92

The amount paid for salaries during the year constituted 67 per cent. of the total expenses, the amount paid for expenses 30 per cent., and the amount paid for apparatus, equipment, and other items 3 per cent.

The gratifying increase in the income of the University shown in the statement above set forth, is largely due to gifts for special purposes, the fulfillment of which has necessitated larger expenditures. The result has been that while the sphere of our activity has been enlarged, our general budgetary situation has not been greatly relieved.

The increase in the income of the University is due also, of course, to payments amounting to \$70,000 on account of the Hopkins Maintenance Fund and in quite a measure to tuition fees which were considerably larger during the past year.

The result of the increase in income which has been noted, is that for the first time in a number of years we closed the year without a deficit. This result is, of course, extremely gratifying. It does not, however, in any way make less necessary the endeavor to secure a larger endowment. The loss of students due to war conditions will unquestionably reduce our income from tuition fees. On the other hand the maintenance fund which has been such a help to us during the year can be relied on only for the coming two years.

ASSETS AND LIABILITIES (JUNE 30, 1917)

The University has Assets as follows:

Stocks, Bonds, Productive Real Estate, etc., belonging to Endowment Funds	\$6,364,874.91
Bonds, etc., belonging to Special Funds	45,000.00
Plant, Equipment, etc.—	
Howard St. Buildings.....	\$ 990,189.16
Medical School Buildings.....	187,028.34
Homewood Land and Development...	2,243,394.14
New Hunterian Laboratory.....	124,779.18
Equipment, Books, etc.....	654,273.44
	<hr/>
Accounts receivable.....	4,199,664.26
Cash on hand.....	135,982.27
	<hr/>
	39,545.56

Making Total Net Assets (Book Value) \$10,785,067.00

Corresponding to Liabilities, i. e., Funds
and Balances, as follows:

Permanent Endowments (Trust Funds):	
Funds Consolidated for investment	\$5,065,022.28
Funds separately in- vested	1,878,967.11
	<hr/>
	\$6,943,989.39
Unexpended Income of Special Funds..	16,894.48
Sundry Open Accounts.....	104,459.81
Engineering School Building Fund....	49,057.81
	<hr/>
	\$7,114,401.49

Leaving \$3,670,665.51

Which is represented by—

Plant, Equipment, etc.....	\$4,199,664.26
Unrestricted Bequests	225,093.91

\$4,424,758.17

Against which has been charged

Loss on investments....	\$28,524.75
Deficit in Operations to date	334,023.70
Homewood Development in excess of Funds available	391,544.21
	<hr/>
	\$754,092.66
	<hr/>
	\$3,670,665.51

These liabilities deducted should be offset by cash on hand and good current assets. That such is not the case is due to the fact that the University has had to provide cash to meet the accumulated deficits of \$334,023.70 and an amount from General Account for Homewood Development, \$391,554.21, a total of \$725,577.91.

The University has a number of unrestricted legacies, which, together with the proceeds of the University property on Howard Street, when sold, could be applied to liquidate the above liabilities.

In addition to these present assets, the University is interested as remainderman in a number of estates which will be available on the termination of existing life estates. These amount in all to about \$900,000. There are, apart from the liabilities just enumerated, no debts or obligations except that under the will of John W. McCoy the University must pay an annuity, etc., of \$950, which will terminate on the expiration of the life tenancy.

GIFTS AND BEQUESTS

It is a pleasure to be able to report another favorable year so far as concerns the gifts and bequests which the University has received. The General Education Board added \$100,000 to the William H. Welch Endowment for Clinical Research in order to make possible more work in the department of Pediatrics, and also gave us \$250,000 to strengthen the work in the laboratory departments of the Medical School.

Mrs. George Huntington Williams, of this city, her two sons, and Miss Cornelia Williams, of Utica, N. Y., have given the University a fund to be known as "The George Huntington Williams Memorial Fund." One-half of the income of this fund is to be devoted to promoting investigation in the department of Geology. In case a fellowship be established in this department to carry out the purposes of the donors, it is to be known as "The George Huntington Williams Memorial Fellowship." The other half of the income of the fund is to be used to secure a lecturer of distinguished attainments,

who shall lecture upon some topic of widespread contemporary interest, the lectureship to be called "The George Huntington Williams Memorial Lectureship."

Mr. Isaac Forrester Nicholson, of Baltimore, gave to the University the sum of fifteen thousand dollars, the income of which is to be devoted to aiding poor young men to obtain a university education, or to any other purpose which seems desirable to the Trustees of the University.

An anonymous donor has given to the University the sum of \$10,000 to establish a fund, the income of which is to be devoted to the encouragement of research and investigation in Physiology.

Mr. Frank Jewett Mather, Jr., an alumnus of the University, gave us the sum of \$2,000 to be known as the "Morris C. Sutphen Fund," the income of which is to be devoted to the purchase of books for the advanced study of Latin in the graduate department.

Mr. Kenneth Dows, of New York, gave \$19,000 for carrying on research in Tuberculosis and for remodelling the laboratory.

Mr. J. E. Aldred, of New York, gave \$5,000 for fitting up the undergraduate Chemical Laboratory and for the furtherance of the practical side of engineering instruction.

Mr. Henry Phipps, of New York, gave \$8,500 to meet the expenses of instruction in the department of Psychiatry, which conducts the Phipps Clinic.

An anonymous donor gave \$5,000 for the department of Art as Applied to Medicine.

Mr. Robert Winsor, of New York, gave \$1,000 for the encouragement of research in the department of Psychiatry.

Dr. Albert Shaw, an alumnus of the University, made his annual gift of \$250 for the honorarium of the lectures on "Diplomatic History."

Gifts totaling \$500 were received during the year to cover the cost of assistance in Geology.

A gift of \$1,500 was received from the Rockefeller Foundation for assistance in research in Pharmacology.

A gift of \$1,200 was reported by Dr. Adolf Meyer to defray the salary of an assistant in Psychiatry.

A number of alumni and friends contributed during the year to the Fund for Mathematics, the names of the subscribers being F. D. Murnaghan, Wm. Winchester, A. E. Landry, Simon Dalsheimer, and Miss Teresa Cohen.

For the continuation of the publication of "Modern Language Notes," Mrs. Julia E. Bartlett, of Baltimore, and Mr. L. Dietrich each gave \$100.

In order to provide quarters for the undergraduate students, one of the old Carroll buildings was remodelled into the Students' Activities Building. This building houses a lunch room, a barber shop, students' lounging room, and the Young Men's Christian Association. The building has been a great success. \$1,200 of the fund for the alterations were collected by Dean Brush from alumni and friends.

A gift of \$25 was received to cover the expense of a lecture by Dr. John H. Finley.

Gifts aggregating \$250 were received which enabled us to have Mr. William H. Taft deliver the principal address at the Commemoration exercises held on February 22, 1917.

Mr. H. A. Wagner, President of the Consolidated Gas, Electric Light and Power Company of Baltimore, contributed \$100 for lectures on engineering topics.

In order to assure the giving of courses in Semitic Languages in connection with the Summer Courses of 1917, the following gentlemen made contributions: Jacob Epstein, Simon Dalsheimer, and Harry Friedenwald.

Mrs. Henry Lee Smith gave \$100 for the "Joseph Ker-nochan Garr" scholarship annually awarded in the Medical School.

The Courses in Business Economics were made possible by the subscriptions and friendly support of the following:

Baltimore Trust Company; Safe Deposit & Trust Company; Fidelity Trust Company; Citizens National Bank; Merchants-Mechanics-First National Bank; New Amsterdam Casualty Company; Central Metal & Supply Company; Robert Garrett & Sons; Manu-

facturers' Record; E. Stanley Gary; William H. Fehsenfeld; Merchants & Miners Transportation Company; Falconer Company; G. B. S. Brewing Company; Maryland Casualty Company; Hambleton & Company; Tidewater Portland Cement Company; Consolidated Gas, Electric Light & Power Company; Swift & Company; William B. Oliver; National Bank of Baltimore; Charles H. Koppelman; Robert Ramsay Company; E. B. Hunting; Lawrason Riggs; Alexander Brown & Sons; Mercantile Trust & Deposit Company; Samuel Kirk & Sons; Cahn, Coblens & Company (The Leader); McCormick & Company; Hutzler Brothers; A. W. Gieske; Sharp & Dohme; Commercial Credit Company; Charles T. Crane; W. W. Lanahan & Company; United Railways & Electric Company; Maryland Trust Company; Henry Sonneborn & Company; William H. Graffin; German Fire Insurance Company; Summerfield Baldwin; United States Fidelity & Guarantee Company; J. S. Cosden; Life Insurance Underwriters; H. D. Bush; Charles M. Stieff; Maryland Biscuit Company; John K. Shaw; Builders' Exchange; Board of Trade.

The Night Courses for Technical Workers were made possible, through a guaranty to cover any deficit to the extent of \$10,000, by the following:

Consolidated Gas, Electric Light & Power Company; United Railways and Electric Company; Baltimore Copper Smelting & Rolling Company; Bethlehem Steel Company; Walter B. Brooks; Norman James; Eugene L. Norton; Summerfield Baldwin; George Beadenkopf; Benson & Karr; Victor G. Bloede; Howard Bruce; John M. Dennis; Frank A. Furst; Carl R. Gray; Hambleton & Company; P. O. Keilholtz; Gustavus Ober, Jr.; Poole Engineering & Machine Company; William H. Matthai; J. C. Taliaferro; Joseph P. Kennedy; and one other person whose name is reserved at his request.

PERSONAL MENTION

The University has sustained a most severe loss through the death of Dr. William Bullock Clark, Professor of Geology and Director of the Geological Laboratory, which occurred suddenly at his summer home on the twenty-seventh of July. Professor Clark became an instructor in Organic Geology in this University in 1887 and was promoted through the successive grades until he became Professor in 1894, on the death

of Professor G. H. Williams. Under his efficient leadership the Geological Survey of Maryland was organized in 1896 and he became State Geologist. He also organized the State Weather Service, and was prominently identified with many of the movements in State and City tending to the betterment of the community.

Dr. Edward C. Armstrong, Professor of the French Language, left us at the close of the academic year to assume the duties of a similar chair in Princeton University. Professor Armstrong came to this University as a graduate student in 1893 and has been successively a fellow, instructor, associate, associate professor, and professor. Since the death of Professor Elliott, in 1910, Dr. Armstrong has served as chairman of the Romance Language staff and has in that capacity rendered invaluable service to the University. He has likewise been a most capable and inspiring teacher. Some of the work conducted by him has been intrusted to Dr. David S. Blondheim, a Bachelor of Arts and Doctor of Philosophy of this University, recently Assistant Professor in the University of Illinois, who has been appointed Associate Professor of French.

In the last report it was stated that Professor C. Carroll Marden had assumed the duties of Professor of Spanish in Princeton University. Dr. Marden continued to direct the Spanish work here during the year, coming to Baltimore each week and conducting several graduate courses. He has been connected with this University, as student and teacher, since 1886. He is a Johns Hopkins Bachelor of Arts and Doctor of Philosophy, and has held the posts of instructor, associate, associate professor, and professor, beginning in 1894. We shall miss his valuable service in the important field of study to which he has devoted himself.

The department of Romance Languages has lost another valued teacher through the resignation of Dr. James E. Shaw, Associate Professor of Italian. Dr. Shaw is a Bachelor of

Arts and a Doctor of Philosophy of this University and has been a member of the Faculty since 1900. He has accepted the post of Professor of Italian in the University of Toronto. Dr. G. Gruenbaum has been made Associate in Romance Languages and he will conduct the courses in Italian.

Promotions and appointments, for the next year, in the Philosophical Faculty have been made as follows:

MURRAY P. BRUSH, Ph. D., Dean of the College Faculty.

EDWARD W. BERRY, formerly Associate Professor, Professor of Paleontology.

GEORGE R. GUILD, Major, U. S. Army (retired), Collegiate Professor of Military Science and Tactics.

ROBERT B. ROULSTON, Ph. D., formerly Associate, Associate Professor of German.

JOSEPH T. SINGEWALD, JR., Ph. D., formerly Associate, Associate Professor of Economic Geology.

DAVID S. BLONDHEIM, Ph. D., Associate Professor of French.

EDWIN P. DARGAN, Ph. D., Lecturer in French Literature.

FLORENCE E. BAMBERGER, A. M., formerly Instructor, Associate in Education.

GUSTAV GRUENBAUM, Ph. D., formerly Instructor, Associate in Romance Languages.

WALTER A. PATRICK, Ph. D., Associate in Chemistry.

LEO WOLMAN, Ph. D., Associate in Insurance.

WILLIAM S. GOBTON, Ph. D., Instructor in Physics.

CLARE E. GRIFFIN, A. M., Instructor in Transportation.

ARTHUR C. MILLSPAUGH, Ph. D., Instructor in Political Science.

AARON SCHAFER, Ph. D., Assistant in German.

DAVID E. WEGLEIN, Ph. D., Instructor in Education.

In the School of Hygiene and Public Health the following faculty appointments have been made:

ELMER V. MCCOLLUM, Ph. D., Professor of Chemistry.

WILLIAM W. FORD, M. D., Associate Professor of Bacteriology.

VICTOR E. NELSON, M. S., Associate in Chemistry.

HELEN TRACY PARSONS, M. S., Instructor in Chemistry.

NINA SIMMONDS, B. S., Assistant in Chemistry.

BARNETT SUBB, M. S., Assistant in Chemistry.

Recent appointments in the Medical Faculty are mentioned in the report of the Dean (see Appendix).

JOHNSTON SCHOLARSHIPS

The incumbents of the Johnston Scholarships were Howard S. Fawcett (M. S., University of Florida, 1908), Associate Professor in the University of California (on leave of absence), in the department of Plant Physiology; Alexander Green (Ph. D., Columbia University, 1914), recently Instructor in the University of Illinois, in Germanic Philology; Karl S. Lashley (Ph. D., Johns Hopkins University, 1914), in the department of Psychology (reappointed from the previous year).

COMMEMORATION DAY

The University observed the forty-first anniversary of its opening with public exercises in the Lyric Theatre on the morning of Thursday, February 22. The opening prayer and the benediction at the close were said by the rector of Grace and St. Peter's Church, Rev. Romilly F. Humphries. The orator of the day was the Honorable William H. Taft, who chose for his subject "Wise and Unwise Extension of Federal Power." An oil portrait of the late Dr. Christopher Johnston, Jr., Professor of Oriental History and Archaeology in this University, was presented by the Maryland Society of Colonial Dames of America, Dr. David M. Robinson reading the letter of presentation. The President spoke of the progress and achievements of the University during the preceding twelve months. He announced that the Trustees had since the last Commencement authorized the conferring of degrees as follows: Doctor of Philosophy upon Clarke Cothran Minter, of North Carolina, and Elias N. Rabinowitz, of Baltimore; Doctor of Medicine upon Rowland Sill Briggs, of California, and George William Henry, of New York; Bachelor of Arts upon Myron Everhart Bagley, of Maryland, and Ira Owen Wade, of Virginia; Bachelor of Science upon Mary Stella Johnson, of Georgia. The general Alumni Association held its annual meeting at the Lyric Theatre immediately

after the public exercises; the usual banquet was omitted. The addresses of Mr. Taft and the President are printed in the *University Circular*, February, 1917, together with the proceedings of the Alumni Association's meeting.

CONFERRING OF DEGREES

Degrees were conferred Tuesday, June 12, at 4 o'clock, in the Lyric Theatre. Rev. Morris S. Lazaron, Rabbi of the Madison Avenue Temple, offered the invocation. Hon. Newton D. Baker, Secretary of War, a member of the Class of 1892, spoke of the part which University men must play in the upbuilding of the nations devastated by the present world war. The substance of his address is printed in the *University Circular*, June, 1917. The President of the University addressed the candidates for degrees and awarded diplomas as follows: Bachelor of Arts, forty-two; Bachelor of Science in Engineering, thirty-seven; Bachelor of Science, two; Master of Arts, thirteen; Doctor of Philosophy, forty-two; Doctor of Medicine, ninety. He also announced several important gifts. In the evening the graduates and their friends were received informally by the President and Faculty in Gilman Hall. In connection with the Commencement exercises the Class of 1892 celebrated the twenty-fifth anniversary of their graduation, a considerable proportion of the class being present.

ACADEMIC CELEBRATIONS

Representatives of the University have attended the following academic and educational gatherings: The annual meeting of the Association of American Universities, President Goodnow and Professor Howell; the Conference of Southern Colleges and Secondary Schools, Professor French; the annual meeting of the Association of Urban Universities, Professor Robinson; the inauguration of the new Presidents of Mills College in California and the State University of Iowa,

the delegates being alumni of this University, Professors A. C. Lawson and G. L. Houser, respectively.

PUBLIC LECTURES AND ASSEMBLIES

The twenty-second course of lectures on the Percy Turnbull Memorial Foundation was given by Professor Edward Capps, of Princeton. The general subject was "Formative Influences in Greek Tragedy," which was treated in six lectures. (April 30-May 11).

The James Schouler Lectures on History and Political Science, being the eighth course on this foundation, were delivered by Dr. David Jayne Hill, author and diplomat. He gave six lectures, his subject being "International Readjustments." (March 6-22).

The J. E. Aldred Lectures on Engineering Practice were inaugurated this year with a course of nine lectures by practical engineers and managers of industrial corporations. Three lectures were given in each of the three general subjects provided for in the Department of Engineering. The lecturers and their topics are named in the statement of the Department of Engineering appended to this report. The lectures were given in March and April.

A course of five lectures was given the last week in April by Dr. George Sarton, Editor of *Isis* and Lecturer in Harvard University, on "Science and Civilization in the Time of Leonardo da Vinci."

The first lecture in the second series under the joint auspices of the University and the Women's Civic League was given in the Civil Engineering Building on December 6. The lecturer was Dr. William H. Park, of the New York Department of Health, who spoke of the "Dangers of Impure Milk and the Importance of Milk as a Food." The second lecture was given in the Mount Vernon Place Methodist Church, December 13, the lecturer being Dr. Simon Flexner, of the Rockefeller Institute, New York, and his subject "Infantile Paralysis in Relation to Public Health." The third lecturer

was Dr. John H. Finley, Commissioner of Education of the State of New York, who spoke on January 26, also in the Mount Vernon Place Church, on "Training for Leisure."

The Albert Shaw Lectures on Diplomatic History were given this year by Professor Payson J. Treat, of Leland Stanford University. The subject was "Early Relations between the United States and Japan." The course was given in January and consisted, as usual, of ten lectures.

Mr. L. O. Armstrong, of the Department of Public Instruction of the Bureau of Commercial Economics in Washington, lectured on the "Water Power of Canada," January 9.

The University coöperated with Goucher College in providing a lecture by Professor Charles W. Wallace, of the University of Nebraska, on "New Shakespeare Discoveries from English Archives." The lecture was given in the College auditorium, March 21.

The following local and national organizations have used the halls of the University: The Baltimore Society of the Archaeological Institute of America; the American Red Cross; the Baltimore Municipal Art Society.

AWARD OF PRIZES

The Severn Teackle Wallis Memorial Prize, established by the Wallis Memorial Association of Baltimore, was won this year by Winifred Sturdevant, A. B., who presented an essay entitled "A Comparison of the *Misterio de los Reyes Magos* with the Latin Liturgical Epiphany Plays."

The Tocqueville Medal, annually given to the University by Baron Coubertin, of Paris, was awarded on Commencement Day to Joseph Louis Krieger (of the third-year undergraduate class), the subject of whose speech in the contest held in the spring was "The French Revolution of 1848."

The twentieth annual Inter-class Debate and Contest in Public Speaking for the Adams prizes and medal, respectively, were held March 3. The subject of the debate was "Compulsory Arbitration of Labor Disputes." The Senior

Class team, composed of Eugene A. Edgett, Reuben Oppenheimer, and Alexander A. Steinbach, which had chosen the negative side of the subject, was adjudged winner of the debate. The speaking contest was won by Corydon P. Gowman, of the second-year class.

VISITS TO SOUTHERN UNIVERSITIES

During the month of April Professor David M. Robinson visited several of the Southern universities, including the University of Cincinnati, the University of Louisville, Vanderbilt University (Nashville), the George Peabody College (Nashville), the University of the South (Sewanee), the University of Chattanooga, the University of Tennessee (Knoxville), Trinity College (Durham), the University of North Carolina (Chapel Hill). In almost every case an address was given before an assembly of the students of the institution visited, or an illustrated lecture was given before a larger audience in some public hall. The cordial reception everywhere accorded and the opportunity given at luncheons and smokers, as well as at the lectures themselves, to meet the members of the various faculties and the alumni made it perfectly apparent that the plan of sending a yearly visitor to the South is of mutual benefit to the University and our alumni and should be continued.

Dean Brush also spent the last week in February among our alumni in Virginia and Georgia. He spoke at the alumni dinners in Richmond and Atlanta, and found the interest in the Johns Hopkins keenly alive in both places; in Atlanta, particularly, there is a large and flourishing group of men. He also addressed the students of the University of Georgia and met the Hopkins Alumni in the Faculty.

Respectfully submitted,

FRANK J. GOODNOW,

President.

September 30, 1917.

REPORTS ON THE INSTRUCTION IN THE CHIEF BRANCHES OF STUDY, 1916-17

Prepared by the Principal Instructors in the Several Departments

CHEMISTRY

The following courses of instruction were given:

I. *An elementary course of experimental lectures*, accompanied by classroom conferences and examinations and extending through the year.

II. *A laboratory course*, also extending through the year, which was taken simultaneously with Course I, and was designed to familiarize beginners with the experimental side of chemistry.

Courses I and II were under the direction of Professor Gilpin, who was aided by Dr. Miller and two assistants.

III. *Systematic Inorganic Chemistry*, a lecture course extending through the year, taken by undergraduates who had previously completed courses I and II, and by some graduates from other institutions.

IV. *A laboratory course*, extending through the year, in the reactions and preparations of inorganic compounds and in quantitative and qualitative analysis. This course was taken in conjunction with Course III.

Courses III and IV were under the direction of Associate Professor Lovelace and Dr. Miller, who were aided by two laboratory assistants.

V. *Systematic Organic Chemistry*, a course of lectures given by Professor Gilpin, which extended through the year and was taken by the more advanced undergraduates and by the less advanced graduates from other institutions.

VI. *A laboratory course*, under the direction of Professor Gilpin in the reactions and preparations of organic compounds.

VII. *Advanced Inorganic Chemistry*, a course of lectures by Associate Professor Lovelace, which extended through the year.

VIII. *Advanced Organic Chemistry*, a course of lectures, extending through the year, by Professor Reid.

IX. *A laboratory course*, extending through the year, in the reactions and preparation of organic compounds, by Professor Reid.

X. *Quantitative Chemistry*, a laboratory course, extending through the year, by Professor Frazer.

XI. *Physical Chemistry*, a course of lectures, extending through the year, by Dr. Lloyd.

XII. *Physical Chemical Methods*, a laboratory course conducted by Mr. Sease.

XIII. *History of Chemistry*. A course of lectures by Professor Remsen.

XIV. *Quantitative Chemistry*. A course of lectures by Professor Frazer.

XV. *Special Lectures*. Brief courses of lectures were given by Professor G. N. Lewis, of the University of California, Professor J. Stieglitz, of the University of Chicago, Dr. Irving Langmuir, of the General Electric Company Laboratory, Dr. W. A. Patrick, of Syracuse University, Professor E. C. Bingham, of Lafayette College, Dr. F. H. Getman, Professor J. L. Howe, of Washington and Lee University, and Professor H. N. Holmes, of Oberlin College.

XIV. *Lectures by Advanced Students*. To each of the more mature students, there is assigned for historical investigation some important topic in chemistry. The results of his investigations are incorporated in a lecture which he gives before the teaching staff and the students. Seventeen such lectures have been given during the past academic year.

RESEARCH

During the past year a great variety of problems has been under investigation by the teaching staff and the advanced students who were associated with them.

Professor Morse, working under grants from the Carnegie Institution of Washington, has had Dr. J. M. Blocher associated with him. The problem which has been investigated is:

The accurate measurement of the osmotic pressure of cane sugar solutions of the same concentrations and at the same temperatures as in the original experiments of Pfeffer.

Professor J. C. W. Frazer has had associated with him Dr. C. C. Minter, Messrs. G. H. Whiteford, and W. L. Linton. The problems which have been investigated are:

1. The osmotic pressure of aqueous solutions of glucose over the whole range of its solubility (with Dr. Minter).
2. Improvements in cells for measuring the osmotic pressure of concentrated solutions (with Dr. Minter).
3. The use of protective agents in the measurement of the osmotic pressure of electrolytes (with Dr. Blocher).
4. The use of barium salts in the decomposition of silicates (with Mr. Whiteford).

Professor Reid had associated with him in research Messrs. Faber, Freas, Gordon, Lyons, Helm and Lotz. The problems which they studied are:

1. The esterification of aliphatic acids by mercaptans. (Mr. Faber.)

2. The limits of esterification of benzoic and the toluic acids by alcohols. (Mr. Freas.)
3. The solubilities of liquids in liquids. (Mr. Gordon.)
4. The identification of acids. (Mr. Lyons.)
5. Azodyes derived from mercaptans. (Mr. Helm.)
6. The constituents of coal. (Mr. Lotz.)

Professors Frazer and Lovelace have had associated with them in their investigations on the vapor pressure of solutions Messrs. Sease and Rogers. The problem under investigation consisted in measuring the vapor pressures of aqueous solutions of mannite and of potassium chloride.

Dr. Davis, working under a grant from the Carnegie Institution of Washington with the assistance of Mr. H. I. Johnson, was engaged in the completion of research work begun under the direction of the late Professor H. C. Jones. The following problems were investigated:

1. The viscosity of solutions of caesium salts in mixed solvents containing glycerol.
2. The conductivity and viscosity of solutions of certain organic salts in formamid and in mixed solvents containing formamid.

PUBLICATIONS

The publications here mentioned relate largely, of course, to work which was completed during the academic year 1915-1916; much of the work of 1916-1917 will be published next year.

J. C. W. Frazer, with W. W. Holland and E. Miller.

The Recovery of Salts of Potassium and Aluminium from Mineral Silicates. Presented at the Buffalo Meeting of the *Am. Inst. of Chem. Eng.* June 20-22, 1917.

J. C. W. Frazer, with W. W. Holland and E. Miller.

A New Method for the Recovery of Salts of Potassium and Aluminium from Mineral Silicates. *Jour. Ind. and Eng. Chem.*, 9, 935.

E. Emmet Reid.

Studies in Identification. II. The Identification of Phenols. *Jour. Amer. Chem. Soc.*, 39, 304 (1917).

E. Emmet Reid with J. A. Lyman.

The Identification of Acids II. *Jour. Amer. Chem. Soc.*, 39, 701 (1917).

E. Emmet Reid, with Edward Lyons.

The Identification of Acids III. *Jour. Amer. Chem. Soc.*, 39, 1727 (1917).

E. Emmet Reid, with Edgar M. Faber.

Studies in Esterification IX. The Esterification of Acetic and Propionic Acids by Methyl, Ethyl, Propyl, Isobutyl and Isoamyl Mercaptans. *Jour. Amer. Chem. Soc.*, 39, 1930 (1917).

Paul B. Davis.

Report on investigations carried out under the direction of the late Professor Harry C. Jones by Connolly, G. C., Davis, P. B., Hulburt, E. O., Hutchinson, J. F., Johnson, H. I., Lloyd, H. H., Ordeman, G. F., and Pardee, A. M. Studies on Solution in its Relations to Light Absorption, Conductivity, Viscosity and Hydrolysis. *Carnegie Inst., Wash., Pub. No. 260.*

B. F. Lovelace.

Editor: Chemical Directory of the United States.

STUDENTS

The number of students working in the Chemical Laboratory was 154. Of these 37 were graduates, 35 of them following Chemistry as their principal subject.

Nine students were promoted to the degree of Doctor of Philosophy. Their names and the titles of their dissertations are given below:

E. M. Faber: The Esterification of Acetic and Propionic Acids by Methyl, Ethyl, Propyl, Isobutyl and Isoamyl Mercaptans.

R. Freas: Esterification Limits of Benzoic and Toluic Acids with Lower Alcohols.

N. E. Gordon: The Solubility of Liquids in Liquids.

H. I. Johnson: The Conductivity and Dissociation of certain Inorganic and Organic Salts in Formamid and in mixtures of Formamid and Ethyl Alcohol.

E. L. Lyons: The Identification of Acids.

C. C. Minter: Osmotic Pressure and Heat of Dilution of Concentrated Glucose Solution.

T. H. Rogers: Vapor Pressure and Osmotic Pressure of Mannite at 20 degrees.

V. B. Sease: Vapor Pressure Lowering of Potassium Chloride Solution at 20 degrees.

G. H. Whiteford: A study of the Decomposition of Silicates by Barium Salts.

E. EMMET REID,
Secretary, Chemical Staff.

CLASSICAL ARCHAEOLOGY AND ART

The work in Classical Archaeology and Art has been carried on by means of the Archaeological Seminary, various courses of lectures and practical exercises, demonstrations in the museum of the University, and especially by means of conferences with individual students. The members of the Seminary, meeting weekly, devoted their attention to topics and problems in Greek Private Life and Mythology.

In addition to his direction of the Seminary for the year, Professor Robinson lectured once a week through the year on Greek Private Antiquities and once a week through the year on Greek Vases and Greek Mythology. In the courses for teachers he conducted the course on the History of Art for the first half year. In the Greek Department he conducted a course, meeting once a week, on the Dialogues of Plato which deal with the subject of rhetoric. He also lectured once a week on the History of Greek Literature.

During the year Professor Robinson has also given a number of public lectures. In November he attended the Association of Urban Universities in New York and spoke on "The Work of the Johns Hopkins University" along those lines. In the same month he made the principal address at the Classical Section of the Michigan State Teachers' Association which met at Grand Rapids. During the Christmas holidays he attended the meetings of the American Philological Association and of the Archaeological Institute of America at St. Louis, and read a paper on "The Greek Vases at the Johns Hopkins University." On February 16, he gave the first lecture in the course on Art Appreciation given at the Peabody Institute, under the auspices of the School Arts League, of which he is honorary president. The subject was "Greek and Roman Art." At the meeting of the College Art Association in Cincinnati, April 5, he read a paper on "Reproductions for the College Art Museum." On April 6, at the University of Cincinnati, he lectured on "Caricature in Ancient Art." On the evening of the same day, he was the guest of the Classical Association of the Middle West and South at their Thirteenth Annual Meeting held at Louisville, and he gave an illustrated address on "Classical Sites in Asia Minor including the Seven Churches." He then made a trip to several of the southern universities as the visitor of the Johns Hopkins University for the year, and gave lectures on archaeological subjects in Nashville (Vanderbilt University), Sewanee (University of the South), Knoxville (University of Tennessee), Durham (Trinity College), Chapel Hill (University of North Carolina). At the Eastern High School, on April 21, he gave an illustrated lecture on "Asia Minor." At the University Club, on May 11, he gave an illustrated talk on "Excavated Cities of Asia Minor with an account of the Modern Turk and His Customs."

Associate Professor Magoffin lectured once a week through the year on Roman Epigraphy. In addition to the reading and interpretation of many inscriptions from the Corpus Inscriptionum Latinarum, there were practical exercises in the dating and reading of the in-

scriptions on the original stones, bronzes, and terra cottas in the Archaeological Museum of the University.

The undergraduate course in Roman Life has been carried on by lectures supplemented by the stereopticon and other kinds of illustrative material, and by visits to the Museum, where Roman building materials, household utensils, coins, bronzes, and marbles were studied at first hand.

Associate Professor Magoffin gave two open lectures on "Roman Archaeology" and on "Athletic Sports among the Greeks and Romans" to the students of the Columbia University Summer Session of 1916, where he gave two courses in Greek and Roman History. He was sent, in November, by the Archaeological Institute of America, of which he is Recorder, on its Middle West lecture circuit, on which he gave an illustrated lecture entitled "On Foot through the Alban Hills of Italy" before twenty-five local societies and college gatherings. He lectured on December 5 on "Roman Life and Manners" before the Baltimore Chapter of the Federation for Child Study, on January 11, 1917, on "Roman Home and Family Life" before the Latin Club of the Western Female High School of Baltimore, and on January 31 on "Some Classic Sidelights on Efficiency" before the Fortnightly Club at the Naval Academy, at Annapolis, Md. He attended, as outside lecturer, the fifty-second annual meeting of the Michigan Schoolmasters' Club at the University of Michigan, March 26-30, where he delivered four illustrated lectures on "Roma Imperatrix Mundi," "Contemporaneous Pictures of Roman Life and Death," "The Roman in his Hours of Ease," and "The Serious Work of Roman Life."

Lectures were given under the auspices of the Archaeological Society by Mr. Herbert J. Spinden of the American Museum of Natural History, Professor George H. Edgell of Harvard University, Professor L. B. Paton of the Hartford Theological Seminary, and Professor Clarence P. Bill of Adelbert College, Western Reserve University. Students of the Archaeological Department attended these lectures as part of their work.

Miss Shields, now instructor at Smith, who took her Ph. D. in Classical Archaeology in June, 1915, has published her dissertation on "The Cults of Lesbos"; and Miss Armstrong, now instructor at Goucher, who took her Ph. D. in June, 1915, has published her dissertation on "Color in Roman Ritual."

Needs.—The needs of the Department of Archaeology and Art, which was established only twelve years ago, and which has received inadequate appropriations, are great. Many of the important archaeological publications are lacking in the library, and funds are especially needed to purchase photographs, to mount and care for those we have, and to buy some of the more expensive illustrated archaeological books, to provide a fine collection of lantern slides, and to purchase antiquities and casts to add to our excellent archaeological museum. Funds are also needed to publish a catalogue of the museum and especially of the beautiful collection of coins recently presented by one of our former trustees, Mr. Buckler. Ultimately a chair of mediaeval and modern art should also be established. Money is needed for all these things and there are

always many opportunities for archaeological research such as the excavation of Sardis, which has already yielded things of the highest artistic and linguistic importance, the inscriptions being published by Mr. Buckler and Professor Robinson.

PUBLICATIONS

David M. Robinson.

Review of Thompson's, *The Greek Tradition, Essays in the Reconstruction of Ancient Thought*. *Art and Archaeology*, iv, 1916, p. 126.

Review of Wolfson's *Ancient Civilization*. *Art and Archaeology*, iv, 1916, p. 189, and *The Classical Weekly*, x, 1917, pp. 111-112.

Review of Carus' *The Venus of Milo. An Archaeological Study of the Goddess of Womanhood*. *Art and Archaeology*, iv, 1916, p. 190, and *The Classical Weekly*, x, 1917, p. 216.

Review of Fowler's *A History of Sculpture*. *Art and Archaeology*, iv, 1916, pp. 252-253.

The Place of Archaeology in the Teaching of the Classics. *The Classical Weekly*, x, 1916, pp. 2-8.

An Important Egyptian Collection for the Brooklyn Museum of Art. *Art and Archaeology*, v, 1917, p. 122.

Review of Droop's *Archaeological Excavation*. *Art and Archaeology*, v, 1917, p. 124.

Review of Fox's *Greek and Roman Mythology. The Mythology of All Races. Vol. I*. *Art and Archaeology*, v, 1917, pp. 126-127.

The Altoviti Venus acquired by Mr. John D. Rockefeller. *Art and Archaeology*, v, 1917, pp. 181-183.

More Modern Versions of the Harmodius Hymn. *The Classical Weekly*, x, 1917, pp. 138-142.

Some Greek Vases at the Johns Hopkins University. *American Journal of Archaeology*, xxi, 1917, pp. 86-87.

The College Museum of Reproductions. *Bulletin of the College Art Association of America*, No. 2, 1917, pp. 27-29.

Review of Holborn's *The Need for Art in Life*. *Art and Archaeology*, v, 1917, p. 186.

Review of Miss Rider's *The Greek House. Its History and Development from the Neolithic Period to the Hellenistic Age*. *Art and Archaeology*, v, 1917, pp. 186-187.

Review of Jardé's *La Grèce Antique et la Vie Grecque*. *The Classical Weekly*, x, 1917, p. 175.

Reproductions of Classical Art. *Art and Archaeology*, v, 1917, pp. 221-234.

The Cervantes Monument in Golden Gate Park. *Art and Archaeology*, v, 1917, p. 247.

Review of Diana Watts' *The Renaissance of the Greek Ideal*. *Art and Archaeology*, v, 1917, p. 251.

The Pollaiuolo Madonna recently acquired by Mr. Martin A. Ryerson. *Art and Archaeology*, v, 1917, pp. 304-307.

The Theft of a Greek Head. *Art and Archaeology*, v, 1917, p. 309.

Review of Barstow's Famous Sculpture. *Art and Archaeology*, v, 1917, pp. 315-316.

Review of Miss Seachrest's Greek Photoplays. *Art and Archaeology*, v, 1917, p. 316.

A Vase Fragment in the Style of Oltos used in Restoring a Cylix with a reminiscence of a Satyr-play. *American Journal of Archaeology*, xxi, 1917, pp. 159-168.

Editorial work for *Art and Archaeology*, *The Classical Weekly*, The Johns Hopkins Philological Association, 1916-1917, and *The Johns Hopkins University Circular*, 1917, pp. 30-52.

Ralph V. D. Magoffin.

Review of L. R. Dean's "A Study of the Cognomina of Soldiers in the Roman Legions." *American Journal of Philology*, xxxvii, pp. 217-219.

Review of M. Clerc's "Aqua Sextiae: Histoire d' Aix-en-Provence dans l'antiquité." *American Journal of Philology*, xxxvii, pp. 349-353.

Review of H. B. Van Hoesen's "Roman Cursive Writing." *American Journal of Philology*, xxxvii, p. 354.

The Classical Conference at Columbia University. *Art and Archaeology*, iv, 1916, p. 124.

Review of E. S. Bouchier's "Syria as a Roman Province." *American Historical Review*, xxii, 1916, pp. 193-194.

Review of H. O. Taylor's "Deliverance: The Freeing of the Spirit in the Ancient World." *Classical Weekly*, x, 1916, pp. 30-31.

Review of W. A. Oldfather and H. V. Canter's "The Defeat of Varus and the German Frontier Policy of Augustus." *Classical Weekly*, x, 1916, pp. 47-48.

Review of P. V. N. Myers' "Ancient History." *Art and Archaeology*, v, 1917, p. 125.

Review of E. Cug's "Une Statistique de locaux affectés à l'habitation dans la Rome impériale." *American Journal of Philology*, xxxviii, pp. 96-98.

Luigi Rossini, Engraver. *Art and Archaeology*, v, 1917, pp. 200-212.

Review of Dio's Roman History, Vol. IV (Loeb). *American Historical Review*, xxii, 1917, pp. 693-694.

Review of Miss M. A. Hamilton's "Outlines of Greek and Roman History to A. D. 180." *Classical Weekly*, x, 1917, p. 198.

Review of W. C. Morey's "Ancient Peoples." *Classical Weekly*, x, 1917, p. 198.

Review of J. H. Breasted's "Ancient Times: A History of the Early World." *Classical Weekly*, x, 1917, pp. 199-200.

Current Notes and News. *Art and Archaeology*, iii, no. 6, p. 359; iv, no. 1, pp. 57-58; no. 2, pp. 124-125; no. 3, pp. 186-187; v, no. 1, pp. 51-54; no. 2, pp. 120-122; no. 3, pp. 183-184-185.

Report of Revue de Philologie. *American Journal of Philology*, xxxviii, pp. 100-105.

DAVID M. ROBINSON,

Professor of Classical Archaeology and Epigraphy,
and Lecturer on Greek Literature.

EDUCATION

The second year of work in this subject as a separate department has been very satisfactory.

The Educational Seminary devoted its attention to the field of educational administration, and to the administrative aspects of the problems of specific professional interest to the members. The instruction was directed by Professor Buchner. Subsequent upon a study of the historic development of the problems and the methods of administration special reports and papers were presented as follows: M. Theresa Dallam, "The effects of the study of Latin upon the study of English in high school pupils"; W. H. H. White, "Modes of testing the efficiency of a county school system"; R. E. de Russey, "The formation of a scale for English Composition in the high school"; H. J. Kefauver, "The scientific measurement of the efficiency of teachers"; R. M. Heine, "The adjustment of secondary and collegiate curricula in Maryland"; Selma M. Borchardt, "The history of the use of the school as a community center"; A. R. Gminder, "Organization within the school"; R. H. Dotterer, "Measuring the efficiency of the administration of city school systems."

At the opening of the year, Dr. Bird T. Baldwin, Professor of Psychology and Education, Swarthmore College, was appointed Lecturer in Education. He visited the University regularly on Saturdays, during the year, and gave the instruction and directed the investigations in the course on educational measurements, two hours weekly. The need of experimental work in education was set forth by illustrations from contemporary studies, and training was given in the collection and treatment of data. Reports of the following studies were made: R. R. Long, "Blood pressure norms for school children"; R. M. Heine, "Elimination and retardation of pupils in the public high schools of Maryland"; J. P. Hands, "A comparative study in intelligence of normal white and colored children"; J. H. Owens, "The present status of high school costs for the county high schools of Maryland"; W. H. H. White, "The psychology and pedagogy of adolescence"; H. J. Kefauver, "The organization of a high-school psycho-educational laboratory and some results"; F. Astor, "Memory tests in schools"; Isabel Lazarus and Susan C. Collins, "Individual and group tests for kindergarten children"; B. T. Baldwin and W. F. Shenton, "The relation of the growth of parts of the body to total growth for girls and boys between 6 and 18 years of age."

UNDERGRADUATE COURSES

Undergraduate instruction has been conducted in the College Courses for Teachers. In anticipation of the needs of the new state law, which was to go into effect June 1, 1916, the number of courses was increased so as to enable students at this University to meet the requirements completely.

Professor Buchner gave instruction in the History of Education, Educational Psychology, and Secondary Education, each course meeting two hours a week through the year. He was assisted in the course in Secondary Education by Dr. David E. Weglein, Fellow by Courtesy and Principal of the Western Female High School, who conducted the work from December to May.

Associate Professor C. Macfie Campbell, of the Medical School and the Phipps Psychiatric Clinic, gave a course of ten lectures, accompanied by clinical demonstrations, on the sub-normal child and its training.

At the beginning of the year, Miss Florence E. Bamberger assumed her duties as Instructor in Education, devoting her attention to the development of instruction and investigation in the field of Elementary Education and Supervision. She conducted a course on Elementary Education, two hours a week through the year, and a course on Elementary Supervision, one hour a week through the year. Types of representative lessons were developed in the class room by means of demonstration exercises with a number of classes of children who came to Gilman Hall on Saturday forenoons.

By special arrangement, the opportunity of attending the courses on educational measurements by Professor Baldwin was extended to undergraduate students registering in the College Courses for Teachers.

Towards the close of the year the State Board of Education of Maryland gave an official interpretation of that portion of the new law which specifies that college graduates may qualify for the state high school teacher's certificates "provided they had not less than two hundred recitation hours of instruction in education, including the aims of secondary education, and in the method, observation, and practice teaching of high school studies." The definition of this requirement permitted the department to arrange a sequence of courses of instruction in the history and the principles of education, educational psychology, principles of teaching and special methods in high school subjects, and high school organization and class-room management. These courses are to be opened also to students in the academic department who desire to prepare themselves as secondary teachers and can hereby be enabled to secure a state certificate on the basis of their graduation by the University.

During the year Professor Buchner was occupied as President of the Educational Society of Baltimore, as Vice-President of the American Association for the Advancement of Science and Chairman of Section L, Education. At the two weeks' annual institute of the teachers of Prince George's County, Maryland, in August and September, he delivered two series of lectures, of ten each, on educational psychology and principles of teaching. He gave a series of three lectures in educational theory before all the elementary school teachers of Baltimore during the period of the delayed opening of schools owing to the infantile paralysis situation. He also gave addresses on topics in education before the Maryland High School Teachers Association, The Ministers' Union of Baltimore, The Bal-

timore Teachers Training School, The Potomac Valley Teachers Round Table, Berkeley Springs, W. Va., and on the occasion of the commencements of the Florida State College for Women and the City Teachers Training School, Richmond, Virginia. Miss Bamberger gave addresses before the teachers of Mauch Chunk, Chester, and Lansford, Pennsylvania, conducted a series of experiments in practice-teaching in Baltimore, and an investigation in spelling in Baltimore and Baltimore County Schools with reference to the Ayres scale.

PUBLICATIONS

E. F. BUCHNER.

Educational Surveys, 1916. *Report of the United States Commissioner of Education for the year ended June 30, 1916*. Washington, D. C., 1916, Vol. I, pp. 353-371, Chapter 21.

The 1916 Summer Courses of the Johns Hopkins University. *Fiftieth Annual Report of the State Board of Education of Maryland*, 1916. Annapolis, 1916, pp. 115-122.

The Summer Courses. *The Johns Hopkins Alumni Magazine*, March, 1917, Vol. v, pp. 168-171.

F. E. BAMBERGER.

Democratization of the Recitation Period. *Proceedings of Schoolmen's Week, University of Pennsylvania*, April 12-14, 1917, p. 179.

B. T. BALDWIN.

A Measuring Scale for Physical Growth and Physiological Age. *The Fifteenth Year Book of the National Society for the Study of Education*. Chicago, 1916, pp. 11-22.

J. H. OWENS.

Tables of High School Costs. *Fiftieth Annual Report of the State Board of Education of Maryland*, 1916. Annapolis, 1916, pp. 80-82, 84-88.

M. R. PATTERSON.

A Study of the Bright Child in the School. *Atlantic Educational Journal*, October, 1916, pp. 67-74.

A Preparatory Center in Baltimore. *Atlantic Educational Journal*, January, 1917, pp. 234-238.

EDWARD F. BUCHNER,
Professor of Education.

ENGLISH

1. Advanced Courses.

The advanced students in English are organized into a Seminary, which is conducted by Professor Bright. Graduate students are admitted to the Seminary as soon as they have satisfied initial requirements for specialization and research. The discipline of the Seminary is designed to impart training in scholarly methods of dealing with literary and linguistic problems. Study and investigation are bestowed on selected periods of literary and linguistic history, on departments of literature extending through successive periods, and on the works of important writers, taken separately or in groups. Usually there is a change of subject each half-year. During the academic year 1916-1917, the sessions of the Seminary occupied four hours a week.

The subject studied in the sessions of the first half-year was the literature of the Late West-Saxon period. During the second half-year the poems of Edmund Spenser were critically read. The principal portion of the time was devoted to a group of the Minor Poems.

Professor Bright met a class twice a week, during the first half-year, for an interpretation of the text of the Anglo-Saxon poem *Exodus*.

During the second half-year the same class was conducted in the reading of Chaucer's *Troilus and Criseyde*.

Professor Bright lectured once a week on technical aspects of Grammar and Rhetoric.

He also gave a course in Anglo-Saxon (twice a week) that was to serve as an introduction to Historical English Grammar.

2. College Courses.

English Composition 1, a prescribed course in Rhetoric and English Composition, was given three hours weekly throughout the year. The class met in five sections, which consisted, at organization, of about thirty men each. Section A was taught by Associate Professor French, Sections B and C by Dr. Powell, Section D by Mr. Janney, and Section E by Mr. Wise. The work of the course included, besides the study of the principles of prose composition, the regular writing of themes and essays, the reading month by month of certain prescribed works in prose and verse, and, on the more important of the essays, private conferences with the instructors. Lomer and Ashmun's *The Study and Practice of Writing English* was used as a text-book of Rhetoric, and Francis C. Lockwood's *The Freshman and his College* served at the same time as a collection of specimens of expository prose and a source of helpful advice to first-year students. Section A used in addition to these books a privately printed work by Professor Percy W. Long, entitled *Prose Style*.

English Composition 2, prescribed for students graded less than "8" in Composition 1, was prevented by changes in the schedule

from meeting as in previous years. It was therefore conducted as a conference course, the students writing weekly themes and receiving individual criticism and instruction from Dr. Powell and Mr. Janney. Lomer and Ashmun's *The Study and Practice of Writing English* was used for reference.

Professor Greene conducted an elective course in Description and Narration (English Composition 3) twice a week, throughout the year. During the first half-year there was weekly practice in the writing of short papers; during the second half-year longer papers were written at intervals of two or three weeks. The classroom exercises were devoted to the discussion of the written work, and to the critical reading of illustrative passages from standard prose.

English Literature 1 was conducted by Professor Greene, three hours a week, through the year. This class made a general survey of English Literature from the beginning until about 1600. A considerable amount of the poetry of Chaucer and of Spenser was studied critically in the class-room; and more was privately read by members of the class: Books XVIII-XXI of Sir Thomas Malory's *Morte Darthur* and Book II of Sir Thomas More's *Utopia* were also included in the private reading. In addition to the regular classroom exercises, five readings from the poems of Chaucer were given for the benefit of those members of the class who wished to attend them.

English Literature 3 was given by Professor Greene, three times a week, through the year. During the first term a study was made of the English and Scottish Popular Ballads, and of the poems of Burns and Scott. During the remainder of the year the course included a study of poetry as represented in the writings of Wordsworth, Coleridge, Byron, Keats, and Shelley, and of the novel as represented in the writings of Scott and Dickens. In connection with the weekly lectures and discussions the members of the class did a large amount of private reading and prepared eight papers.

Associate Professor French gave an elective course in American Literature (English Literature 4), three hours weekly, through the year. The course consisted of a rapid survey of literary history and literary biography, followed by a more detailed study of the works of American writers as illustrative of the various literary types. Essays, brief papers, and oral reports constituted an important part of the course. W. B. Cairns's *A History of American Literature* was used as a manual, and W. C. Bronson's *American Poems* and the same author's *American Prose* served as anthologies.

English Literature 5, prescribed for engineering students, was conducted by Dr. Powell, three hours a week, through the year. The course included a general survey of English literature from the beginning to 1850. Special study was given to works reflecting important historic movements and to the development of literary types. Cunliffe, Pyre, and Young's *Century Readings in English Literature* was used as a handbook, and collateral reading was assigned.

English Literature 6 was given by Professor Greene, three hours a week throughout the year. This course included (a) the reading

and discussion of fourteen of the plays of Shakspeare, representing various types, and a careful study of *King Henry the Fourth, Part I*, and of *Macbeth*; (b) a survey of the origin and development of the English drama from the liturgical plays to the decline of the drama. The class read and discussed representative Miracle Plays, Moralities, and Interludes; Early Comedy and Early Tragedy; representative plays by Lyly, Peele, Greene, Kyd, five plays by Marlowe, and two plays by Ben Jonson.

Public Speaking 1, a course in Reading and Public Speaking prescribed for undergraduates in their second year, was given, one hour a week, through the year. The class was divided into eight sections, averaging twelve men each, and was taught by Associate Professor French, Mr. Hammond, and Mr. Wise. The first half-year was devoted to a study of the elementary principles of expression and to practice in reading. Selected shorter poems by Browning were used during this term as illustrative material. The second half-year was given to the study and practice of the occasional speech, both prepared and extemporaneous. Knapp and French's *The Speech for Special Occasions* was used as a text-book.

Public Speaking 2, an elective course in debate and oral discussion, was given, one hour a week, through the year, by Associate Professor French. The course included lectures on the theory of argument, class debates and written arguments, and a few lectures on parliamentary law. J. H. Gardiner's *The Making of Arguments* and Robert's *Rules of Order* served as text-books.

The Adams Contest, held March 3, 1917, afforded additional practice in public speaking and debate. Contestants for the Adams medal, chosen from the Class of 1919 by a preliminary contest, and the debating teams of the classes of 1917 and 1918 were trained in delivery by the instructors in public speaking. The Adams trophy and individual prizes were won by the Class of 1917, and the Adams Medal was won by Mr. Corydon P. Gowman, Jr. Arrangements had been made for the usual intercollegiate debates and for the annual oratorical contest; but on account of the declaration of war with Germany these exercises were given up.

3. College Courses for Teachers.

A course for teachers, designed to cover practically the same ground as the college course in English Composition 1 but from a somewhat more mature point of view, was given by Dr. Powell, twice a week, through the year. Lomer and Ashmun's *The Study and Practice of Writing English* was used during the first semester as a text-book; the lecture method was employed altogether during the second.

A course in American Literature (English 3) was given by Associate Professor French. The class met for a two-period session one night a week from October to June. The work of the course was as nearly parallel to that of English Literature 4 of the college courses as circumstances permitted. The writing of essays and reports was an essential part of the course. Cairns's *A History of American Literature* and Bronson's *American Poems* and *American Prose* were used as text-books.

4. Public Lectures.

The twenty-second course of the Percy Turnbull Memorial Lectures on Poetry was delivered by Professor Edward Capps, of Princeton University, April 30-May 11, 1917. The course consisted of six lectures on "Formative Influences in Greek Tragedy": (1) Introductory; (2) The Primitive Theatre; (3) Change and Experiment; (4) The Athenian Public; (5) Popular Demands; (6) The Conscious Art of Tragedy.

PUBLICATIONS

James W. Bright.

Rhythmic Elements in English, with Illustrations from Shakespeare. *A Memorial Volume to Shakespeare and Harvey*, published by the University of Texas, 1917, pp. 68-88.

Brief Mention of the following books: James R. Johnston, *The Place-Names of England and Wales*;—G. H. Cowling, *The Dialect of Hackness (North-East Yorkshire)*;—Arthur S. Napier, *Iacob and Iosep, a Middle English Poem of the Thirteenth Century*;—Sir Arthur Quiller-Couch, *On the Art of Writing*;—William Odling, *The Technic of Versification*;—Louis Worthington Smith, *The Mechanism of English Style*;—Frank W. Cady, *The Old Wives' Tale, a Play by George Peele*;—Felix Emil Held, *Christianopolis, an Ideal State of the Seventeenth Century* by Johann Valentin Andreae;—Gertrude Buck, *The Social Criticism of Literature*;—George Van Ness Dearborn, *How to Learn Easily*. *Mod. Lang. Notes* (xxx), June, 1916—(xxxii), June, 1917.

John C. French.

Brief Mention of Walter C. Bronson, *American Prose*. *Mod. Lang. Notes* xxxii, 128.

The Omicron Delta Kappa Society. *The Johns Hopkins Alumni Magazine*, v, 165-167.

Chilton L. Powell.

New Material on Thomas Carew. *Mod. Lang. Review*, xi, 285-297.

English Domestic Relations, 1487-1653. *A Study of Matrimony and Family Life in Theory and Practice as revealed by the Literature, Law, and History of the Period*. New York, Columbia University Press, 1917, 8vo., xii + 274 pp.

JAMES WILSON BRIGHT,
Caroline Donovan Professor
of English Literature.

GEOLOGY

The Geological Laboratory was open daily throughout the year for graduate and undergraduate students. Lectures, field studies, and laboratory work were conducted as follows:

LECTURES

Undergraduate Courses

(a) Geology I: Physiography, Dynamical and Historical Geology, by Professor Swartz. *Three lectures and one afternoon of practical work each week throughout the year.*

(b) Geology II: Mineralogy and Elementary Petrography, by Professor Swartz. *Three lectures and two afternoons of practical work each week throughout the year.*

(c) Geology III: Applied Geology, by Professor Mathews. *Three lectures each week throughout the year.*

Graduate Courses

(d) Principles of Geology, by Professor Clark. *One lecture each week throughout the year.*

(e) Advanced Historical Geology, by Professor Clark. *One lecture each week throughout the year.*

(f) Geological Physics, by Professor Reid. *Two lectures each week throughout the year.*

(g) Exploratory and Geological Surveying, by Professor Reid. *Two lectures each week throughout the year.*

(h) Petrography, by Professor Mathews. *Three lectures and two afternoons of laboratory work each week throughout the year.*

(i) Paleontology, by Associate Professor Berry, assisted by Dr. Gardner. *Two lectures and two afternoons of laboratory work each week throughout the year.*

(j) Advanced Paleontology, by Associate Professor Berry. *One afternoon each week throughout the year.*

(k) Ore Deposits of the United States, by Dr. Singewald. *Two lectures each week throughout the year.*

(l) Ore Deposits of South America, by Dr. Singewald. *Two lectures each week throughout the second half-year.*

(m) Meteorology, by Dr. Fassig. *One lecture each week for one-half year.*

(n) Geological Conferences, by Professor Clark. *Weekly, throughout the year.*

FIELD STUDIES

(o) Field trip to study the Paleozoic formations of Western Maryland, by Professor Swartz. *One week in April.*

(p) Field trip to study the ore deposits and mines of Virginia and Tennessee, by Dr. Singewald. *One week in April.*

(q) Summer work on the Maryland Geological Survey. Several of the graduate students were given an opportunity to carry on field work in connection with the various investigations which are being conducted by the Survey. These positions afford unusual opportunities for training in field methods. Payment for services and field expenses is provided.

LABORATORY WORK

(r) The Geological Laboratory was open *daily during the year* for the work of advanced students under the direction of Professor Clark, assisted by the other members of the staff.

ACTIVITIES

Professor Clark continued his investigation of Atlantic Coastal Plain geology during the year with the co-operation of several associates. The report on the Geology and Paleontology of the Cretaceous Formations of North Carolina, for which he prepared several chapters, is now in press. Professor Clark prepared, during the year, a manual on the Geography of Maryland including Delaware and the District of Columbia which will be published both by the Federal and State Surveys. A digest of this memoir has been published as the Maryland Supplement to Brigham and McFarlane's "Essentials of Geography." Professor Clark also prepared, with the assistance of his associates, a report on the Surface and Underground Waters of Maryland for the National Research Council and the U. S. Geological Survey and is at present engaged on a report on the materials in Maryland for highway and railroad construction. Professor Clark is also actively engaged, as in the past, in the management of the Maryland Geological Survey and the Maryland Weather Service and also as Executive Officer of the State Board of Forestry. Professor Clark has been made chairman of a subcommittee on Materials for Rapid Highway, Railroad, and Fortification Construction Behind the Front, appointed by the Geological Committee of the National Research Council. He has also been appointed by the Governor of Maryland member of the Maryland Council of Defense and chairman of a committee on Natural Resources and Highways. He was re-elected Treasurer of the Geological Society of America.

Professor Reid was engaged during the year in the continuation of his seismological investigations. He was made member of a committee of the National Research Council to study the application of geology to military affairs and proceeded to Europe in April with other American scientists to examine conditions on the Western Front and to co-operate with English and French scientists. Professor Reid also continued his work on the scientific problems presented by the slides in the Panama Canal, he having been sent, the

past year, as member of a committee of the National Academy of Sciences, to study the difficulties produced by the slides in the Culebra Cut.

Professor Mathews, in the course of his investigations of the Piedmont, has made a study of certain peculiar features of the Susquehanna gorge, their origin and relation to the peneplains. As Assistant State Geologist, he has compiled and edited for the Maryland Geological Survey the Curtis Bay and Sparrows Point sheets, covering 40 square miles of territory south of Baltimore which is now the site of a remarkable industrial development. These sheets are an extension of the map of Baltimore and Environs on the scale of 1000 feet to the inch. Dr. Mathews, acting for the National Research Council, has prepared a report on the Water Resources of Delaware and is at work on a similar report on the Road Materials of Delaware.

Professor Swartz has continued his investigations of the Carboniferous strata of Maryland. His work has contributed to a further knowledge of the stratigraphy of the coal fields of Maryland and aided in the solution of the problem of the correlations of these deposits with those of other parts of the Appalachian coal basin. He has completed his investigations of the Silurian of Maryland, the results of which will be published shortly in a monograph which will be issued by the Maryland Geological Survey.

Professor Berry finished, during the year, a study of the middle and upper Eocene floras of southeastern North America for the U. S. Geological Survey, a study of the fossil plants of the Panama Canal for the Smithsonian Institute, and a study of the fossil flora of Bolivia with relation to the time of elevation of the Andes for the U. S. National Museum. During the spring he made a trip to Florida for the Geological Survey of that State to examine a locality where human remains were found in association with other fossils. A report of the conclusions reached has been prepared and will be published shortly. During the latter part of the year he has been working upon a report on the Underground Waters of Maryland.

Dr. Singewald has been engaged during the year in the elaboration of materials which he collected in South America and in the preparation of a textbook on the Economic Geology of South America.

Dr. Gardner has been engaged in completing her work on the Miocene and Pliocene invertebrate faunas of North Carolina and Virginia. The major part of the year has been employed in faunal studies of the Upper Oligocene faunas of Florida for the U. S. Geological Survey.

An important addition to the resources of the department was received during the year from the family of the late Professor George Huntington Williams in the form of a memorial fund of \$10,000 for the advancement of geological research, a field in which Professor Williams, the first instructor in the Department, was so conspicuous a representative.

Through the generosity of Messrs. Clarence W. Watson, T. Garland Tinsley, C. Wilbur Miller, and Samuel G. B. Cook, Dr. W. P. Woodring was enabled to remain at the University during the aca-

demic session to carry on his investigations on the Bowden fauna of the Island of Jamaica.

The paleontological collections were augmented during the year by a collection from the Devonian of Canada presented by N. H. Cowdry.

Dr. Harvey Bassler, a graduate of some years' standing, was appointed Fellow by Courtesy, and during the year continued his monographic studies of the flora of the Coal Measures. Mr. W. T. Thom, Jr., was appointed University Fellow. Dr. Frank Reeves and Mr. J. D. Sears were also appointed Fellows by Courtesy and were engaged in various research problems during the year.

There were sixteen advanced graduate students in the department with geology as their principal subject. Messrs. Thom and Wade absolved the requirements for the degree of Doctor of Philosophy, presenting dissertations on the following subjects:

W. T. Thom, Jr.—The Cretaceous-Eocene Contact in Montana and Dakota.

Bruce Wade—The Gastropoda of the Ripley Formation in Tennessee.

Joseph P. D. Hull absolved the requirements for the degree of Master of Arts, presenting an essay on Soil Classification. He has been appointed Assistant State Geologist of Georgia.

During the field season of 1916 five of the graduate students were employed in geological work in the far West, under the auspices of the U. S. Geological Survey. Six of the graduate students were employed in geological work under the auspices of the Maryland Geological Survey and one under the auspices of the Tennessee Geological Survey. During the year two students left the department for oil work in Oklahoma, one has taken up similar work in Kentucky, and a fourth has taken up coal work in Western Maryland. Messrs. Woodring and Sears were granted leave of absence for a year's geological work in Costa Rica.

PUBLICATIONS

Clark, Wm. Bullock.

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Introduction, Physiography, General Geological Relations, and Correlation of the Cretaceous Deposits of North Carolina. In Geology and Paleontology of the Cretaceous Deposits of North Carolina. *North Carolina Geological Survey*. In press.

Report on the Surface and Underground Waters of Maryland. Prepared for the National Research Council.

Public Water Supplies of Maryland. Prepared for the Maryland Council of Defense.

Reid, Harry Fielding.

- Variations in Glaciers. *Jour. Geol.*, vol. xxiv, pp. 511-514, 1916.
 Note on the Earthquakes at Almirante, Republic of Panama, in April, 1916. *Seism. Soc. of Amer. Bull.*, vol. vii, 27-30, 1917.

Mathews, E. B.

- The University in its New Home. Foreword. *J. H. U. Circ.*, no. 10, pp. 5-9, 1916.
 Tolchester Folio Maryland (with B. L. Miller and others). *U. S. Geol. Surv., Geologic Atlas* No. 204, 14 pp., 1917.
 The Use of Average Analyses in Defining Igneous Rocks. *J. H. U. Circ. n. s.*, no. 3, pp. 12-17, 1917.
 Submerged "deeps" in the Susquehanna River. *Bull. Geol. Soc. Amer.*, vol. xxviii, pp. 335-346, 1917 (in press).
 Curtis Bay Sheet. Scale 1 inch equals 1000 feet. *Maryland Geol. Survey*, 1917.
 Sparrows Point Sheet. Scale 1 inch equals 1000 feet. *Maryland Geol. Survey*, 1917.

Berry, Edward W.

- A Lower Eocene Zamia. *Torrey*, vol. x, pp. 177-179, 3 figs., 1916.
 The Mesozoic Flora of Tennessee. *Bull. Torrey Bot. Club*, vol. xliii, pp. 283-304, 1 pl., 1916.
 The Environment of the Ape Man. *Scientific Monthly*, vol. iii, pp. 161-169, 3 figs., 1916.
 The Lower Eocene Floras of Southeastern North America. *U. S. Geological Survey*, Professional Paper No. 91, 481 pp., 177 pls., 16 figs., 1916.
 The Pliocene Citronelle Formation of the Gulf Coastal Plain and its Flora. *U. S. Geological Survey*, Professional Paper No. 98L, pp. 193-204, pls. 44-47, 1916.
 The Catahoula Sandstone and its Flora. *U. S. Geological Survey*, Professional Paper No. 98M, pp. 227-243, pls. 55-60, 1916.
 The Mississippi Gulf Three Million Years Ago. *Scientific Monthly*, vol. iv, pp. 274-283, 8 figs., 1917.
 Notes on the History of the Willows and Poplars. *Plant World*, vol. xx, pp. 16-28, 1 map, 1917.
 The Mesozoic Flora of Arkansas. *Bull. Torrey Bot. Club*, vol. xlv, pp. 167-190, 1 pl., 1917.
 The Age of the Bolivian Andes. *Proc. Natl. Acad. Sci.*, vol. iii, pp. 283-285, 1917.
 A Middle Eocene Member of the "Sea Drift" *Amer. Jour. Sci.*, 4th ser., vol. xliii, pp. 198-300, 2 figs., 1917.
 The Delta Character of the Tuscaloosa Formation. *Johns Hopkins University Circular n. s.*, No. 3, pp. 18-24, 2 figs., 1917.
 The Classification of Vascular Plants. *Proc. Natl. Acad. Sci.*, vol. iii, pp. 330-333, 1917.
 A Sail Fish from the Virginia Miocene. *Amer. Jour. Sci.*, 4th ser., vol. xliii, pp. 461-465, 2 figs., 1917.

Singewald, J. T., Jr.

- Substitutes for Coal in the Andes (with Benj. L. Miller). *Coal Age*, vol. ix, pp. 1040-1043, 1916.
- The Cerro de Pasco District, Peru (with Benj. L. Miller). *The Eng. and Min. Journal*, vol. ci, pp. 1015-1018, 1916.
- The Gold Mines of Brazil (with Benj. L. Miller). *The Eng. and Min. Journal*, vol. cii, pp. 207-212, 1916.
- Exploitation of Chilean Mines (with Benj. L. Miller). *The Eng. and Min. Journal*, vol. cii, pp. 289-293, 1916.
- The Pantifño Tin Mines, Bolivia (with Benj. L. Miller). *The Eng. and Min. Journal*, vol. cii, pp. 451-455, 1916.
- Silver-tin Mining in Bolivia (with Benj. L. Miller). *The Eng. and Min. Journal*, vol. cii, pp. 533-535, 1916.
- Prominent Mines of Junin, Peru. *The Eng. and Min. Journal*, vol. cii, pp. 583-587, 1916.
- The Morococha and Casapalca Districts in Peru. *The Eng. and Min. Journal*, vol. cii, pp. 889-893, 1916.
- The Mining Industry of Bolivia. *The Eng. and Min. Journal*, vol. cii, pp. 1005-1009, 1916.
- The Huayni-Potosi Bismuth-Tin Mines of Bolivia (with Benj. L. Miller.) *The Eng. and Min. Journal*, vol. cii, pp. 1065-1067, 1917.
- Conditions Governing Mining in South America (with Benj. L. Miller). *Min. and Eng. World*, vol. xlv, pp. 541-542, 1916.
- The Corocoro Copper District of Bolivia. *The Eng. and Min. Journal*, vol. ciii, pp. 171-176, 1917.
- Mining Conditions at Potosi, Bolivia (With Benj. L. Miller). *The Eng. and Min. Journal*, vol. ciii, pp. 255-260, 1917.
- New Developments in the Porco District, Bolivia. *The Eng. and Min. Journal*, vol. ciii, pp. 329-333, 1917.
- The Role of Mineralizers in Ore Segregations in Basic Igneous Rocks. *J. H. U. Circular n. s.*, No. 3, pp. 24-35, 1917.

Gardner, J. A.

- The Environment of the Tertiary Marine Faunas of the Atlantic Coastal Plain. *Johns Hopkins University Circular n. s.*, No. 3, pp. 36-44, 1917.

Bassler, H.

- A Cycadophyte from the North American Coal Measures. *Amer. Jour. Sci.*, 4th ser., vol. xlii, pp. 21-26, 3 figs., 1916.

Woodring, W. P.

- The Pelecypods of the Bowden Fauna. *Johns Hopkins University Circular n. s.*, No. 3, pp. 44-56, 1917.

Reeves, Frank.

- Origin of the Natural Brines of Oil Fields. *Johns Hopkins University Circular n. s.*, No. 3, pp. 57-68, 1917.

Thom, W. T., Jr.

An Upper Cretaceous Fulgur. *Amer. Jour. Sci.*, 4th ser., vol. xliii, *versity Circular n. s.*, No. 3, pp. 68-73, 2 figs., 1917.

Wade, Bruce.

The Gravels of West Tennessee Valley. *Resources of Tennessee*, vol. vii, pp. 55-89, 7 figs., 1917.

New Genera of Gastropoda. *Proc. Phila. Acad. Nat. Sci.*, 1916, pp. 455-471, 2 plates, 1916.

An Upper Cretaceous Fulgur. *Amer. Jour. Sci.*, 4th ser., vol. xliii, pp. 293-297, 2 figs., 1917.

A Remarkable Upper Cretaceous Fauna from Tennessee. *Johns Hopkins University Circular n. s.*, No. 3, pp. 73-101, 2 figs., 1917.

The Occurrence of the Tuscaloosa Formation as far North as Kentucky. *Idem.*, pp. 102-106, map.

Some New and Little Known Gastropoda from the Upper Cretaceous. *Proc. Phila. Acad. Nat. Sci.*, 1917, pp. 280-304, pl. xvii-xix.

Dorsey, G. E.

The Habitat of *Belemnitella americana* and *muoronata*. *Johns Hopkins University Circular n. s.*, No. 3, pp. 107-129, 1917.

WILLIAM BULLOCK CLARK,
Director of the Geological Laboratory.

GERMAN

The German Seminary, which is organized for study and research in Modern and Middle High German Literature and Language, met three times weekly through the year, under the guidance of Professor Wood. During the first half-year, German Literature in the Sixteenth Century was studied. The work centred in the *Sprüche* and Dramas of Hans Sachs, on which each member of the Seminary contributed a paper. Papers were also presented and discussed on: Luther's Language and Style, Ulrich von Hütten's Dialogues, Reuchlin's *Hanno*, Nikolaus Manuel's and Jakob Ruff's religious Dramas, the Fables of Burkard Waldis, and the relation of Jakob Ayrer's *Sidea* and *Phoenicia* to Shakespeare's *Tempest* and *Much Ado About Nothing*. During the second half-year, Wolfram von Eschenbach's *Parzival* (third, fifth, ninth, and twelfth to sixteenth books) was read. The Epic was compared in detail with the same author's *Titarel* and *Willehalm*, and Wolfram's relation to his sources for the Grail story, more particularly to Crestien de Troyes, was discussed.

The Germanic Seminary, conducted by Professor Collitz, met two hours weekly (on Monday afternoons) through the year. The work of this Seminary was based on the Old Saxon *Helianð*, the exercises being conducted with a view of training the students both in the

methods of text criticism and in the handling of problems connected with the study of the *Heland* from a linguistic and a literary aspect. Papers on special topics were read by some of the students, while all of the members of the Seminary took an active part in interpreting the passages selected for translation and discussion.

The Germanic Society, which is conducted by Professors Wood and Collitz, held three meetings, at which the following papers were read and discussed: Professor Wood, The Three Wedding Nights in the Eddic *Skirnismál* and in Shakespeare's *Midsummer Night's Dream*; Miss Elizabeth F. Johnson, The Relation of Weckerlin's Eclogues to the *Bergerie* of Remy Belleau; Dr. Alexander Green, Review of John Ries, *Was ist Syntax?*

Before the University Philological Association (May meeting) Professor Wood read a paper on the theme of 'The Soul's Transfusion,' in modern literature; Dr. Alexander Green read a communication at the meeting of the Modern Language Association, December, 1916, on The Analytic Syntax and Some Problems of Germanic Philology, and at the February meeting of the University Philological Association, a paper on The Jutes in Beowulf.

Professor Wood gave a graduate course, twice weekly, first half-year, on the History of German Literature in the latter half of the Seventeenth and the earlier Eighteenth Century. The authors receiving the largest share of attention were Hofmannswaldau (Heroical Epistles), Lohenstein (Dramas), Christian Weise (Dramas and Romances), von Canitz (Satires), Wernike (Epigrams), Brockes (Lyrics), Hagedorn (Fables). On each of these authors papers were presented by the members of the course.

During the second half-year, Professor Wood gave a course, twice weekly, on Goethe's Lyrical Poems. The emphasis was placed on the early, formative period, and the poems were studied chronologically in a selection designed to illustrate the gradual change in Goethe's language and style towards classicism.

Professor Wood read, with a class of undergraduates, twice weekly, through the year, Goethe's *Faust*, *Iphigenie* and *Götz von Berlichingen*. In the Winter Classes for Teachers, he gave a course, twice weekly, first half-year, on the German Drama in the first half of the Nineteenth Century. The passage from romanticism to realism was illustrated in detail, and the studies and express statements of Heinrich von Kleist, Grillparzer, Hebbel and Otto Ludwig on the development of the modern German drama were considered. In the case of Hebbel, a comparative study of the *Agnes Bernauer* theme was made in the dramas and dramatic fragments of Törring, Otto Ludwig and Martin Greif. During the second half-year, in the Teachers' Class, twice weekly, selected lyrics from the period of Hans Sachs to the beginning of German Classicism were studied. The method of treatment included not only literary appreciation, but also some systematic attention to rhythmical and metrical expression.

The following graduate courses were given by Professor Collitz:

1. Gothic Grammar. *Twice weekly through the year.* This course was conducted in such a way as to combine with the study of the Gothic language a brief survey of Comparative Germanic grammar, both as regards the grammatical features common to all or to several of the Early Germanic dialects, and their relation to the cognate Indo-Eur. languages. Specimens of the Gothic Bible were read in connection with the study of the grammar.

2. Old Norse Grammar. *Twice weekly, first half-year, and weekly, second half-year.* The elements of Old Icelandic grammar were studied with reference to the language of the Old Norse Runic inscriptions and to the cognate Old Germanic languages (especially Gothic, Anglo-Saxon, and Old High German). Sweet's Icelandic Primer served as a text book both for the study of the grammar and for the reading of selections from Old Icelandic prose.

3. Reynard the Fox in Middle Low German. *Weekly through the year.* The M. L. G. *Reinke de Vos*—although essentially a free translation of the Flemish *Reinaert*—is in some respects the most important of the epic poems generally known as beast epics. It is in any case the best known literary work in Middle Low German literature, and as such was chosen for this course, as an introduction to the study of Middle Low German.

Associate Professor Kurrelmeyer gave the following graduate courses:

Middle High German (Introductory Course). *Two hours weekly, first half-year.* After a rapid survey of Middle High German Grammar, Hartman von Aue's *Armer Heinrich* was read, followed by selections from Bartsch's *Deutsche Liederdichter des zwölften bis vierzehnten Jahrhunderts*.

Middle High German (Advanced Course). *One hour weekly, second half-year.* Selections from the *Nibelungenlied* were read and interpreted, with especial attention to the metre.

He also gave the following undergraduate courses:

Elementary German. *Four hours weekly.* Vos, *Essentials of German*; Grimm, *Kinder- und Hausmärchen*; Gerstäcker, *Germelshausen*; Keller, *Kleider machen Leute*; Wiehr, *Graded Exercises in German Prose Composition*.

German 4. Contemporary Literature in rapid readings. *Three hours weekly.* Sudermann, *Frau Sorge*; C. F. Meyer, *Das Amulet*; Keller, *Romeo und Julia auf dem Dorfe*; Droste-Hülshoff, *Die Judenbuche*; Raabe, *Die schwarze Galeere*; Ernst, *Asmus Sempers Jugendland*; Grillparzer, *Die Ahnfrau*; Hebbel, *Herodes und Mariamne*; Ludwig, *Der Erbfürster*.

Scientific German Readings. *Two hours weekly.* Lassar-Cohn, *Die Chemie im täglichen Leben*; Walther, *Allgemeine Meereskunde*; Helmholz, *Populäre Vorträge*.

Dr. R. B. Roulston, Associate in German, gave the following undergraduate courses:

German 1. Modern Prose Readings. *Three hours weekly.*

Section A. Arnold, *Einst im Mai*; Raabe, *Die Schwarze Galeere*; Keller, *Das Fähnlein der sieben Aufrechten*; Storm, *Psyche*; Sudermann, *Der Katzensteg*; Ibsen, *Der Volksfeind*.

Section B. Arnold, *Einst im Mai*; Storm, *Auf der Universität*; Sudermann, *Frau Sorge*; Keller, *Romeo und Julia auf dem Dorfe*; Storm, *Karsten Kurator*; Fontane, *Grete Minde*.

Prose Composition. *Weekly.* Both Sections. Bacon, *German Composition*, Exercises 1-31.

Private Reading. Both Sections. Rosegger, *Der Lex von Gutenhag*; Fulda, *Der Talisman*.

German 2. Goethe and Schiller. *Three hours weekly.* Goethe, *Hermann und Dorothea*, *Sesenheim*, *Egmont*. Schiller, *Wallenstein*.

Prose Composition. Exercises based upon *Hermann und Dorothea*, and selections from Whitney and Stroebe, *Easy German Composition*.

Private Reading. *Goethe in Italy* (ed. Nichols).

German 3. History of German Literature 1700-1832. *Weekly.* Lectures and recitations. Assigned readings.

College Courses for Teachers: German 2 A. Modern Prose Readings. *Two hours weekly.* Keller, *Die drei gerechten Kammacher*; Wildenbruch, *Der Letzte*; Storm, *Der Schimmelreiter*; Stifter, *Brigitta*.

Prose Composition. *Weekly.* Whitney and Stroebe, *Easy German Composition*, thirty exercises.

German 2 B. Practical Exercises. *Two hours weekly.*

Business Courses: Commercial German. *Two hours weekly.* There was no demand for this, and a course in the elements of German was substituted for the benefit of one student, until the first of February.

Mr. Aaron Schaffer conducted the following course:

German 1, *Section C.* The work was the same as in German 1, *Section A.*

PUBLICATIONS

Henry Wood.

Review of Edward Franklin Hauch, Gottfried Keller as a Democratic Idealist. *Modern Language Notes*, vol. xxxii (1917), pp. 109-113.

Hermann Collitz.

Zu den mhd. kurzen Präterita *gie, fie, lie* (I): *Mod. Lang. Notes*, xxxii, 207-215.

Review of Axel Koch, Brechung und Umlaut im Altschwedischen (Lund, 1916): *Mod. Lang. Notes*, xxxii, 40-44.

William Kurrelmeyer.

Doppeldrucke von Goethe's *Tasso*, 1816. *Modern Language Notes*, xxxi, 94 (1916).

Die Doppeldrucke der zweiten Cotta'schen Ausgabe von Goethes Werken. *Modern Language Notes*, xxxi, 275 (1916).

English translations of Wieland. *Modern Language Notes*, xxxii, 225 (1917).

Brief Mention of various books. *Modern Language Notes*.

Alexander Green.

The Opening of the Episode of Finn in Beowulf. *Publ. of Mod. Lang. Association*, xxxi, 759-797.

P. S. Barto, *Tannhäuser and the Mountain of Venus*. New York, 1916. *Mod. Lang. Notes*, xxxii, 63-64.

E. H. Sehart, *Zur Geschichte der westgermanischen Konjunktion und. Hesperia*, viii. Baltimore, 1916. *Mod. Lang. Notes*, xxxii, 230-235.

T. A. Arnoldson, *Parts of the Body in Old Germanic and Scandinavian*. Diss. Chicago, 1915. *Mod. Lang. Notes*, xxxii, 318-320.

W. M. Patterson, *The Rhythm of Prose*. Diss. Columbia. New York, 1916. *Modern Philology*, xv, 57-60.

HENRY WOOD,
Professor of German.

GREEK

SEMINARY

The work of advanced instruction in Greek is carried on chiefly through the medium of the Greek Seminary, which is the laboratory in which the student is trained to use the apparatus of his profession and to carry out investigations of his own. Since the organization of the Seminary in 1876, it has been the custom of the members to concentrate their attention in any one year on some leading author or some leading department of Greek literature. In pursuance of this custom the principal subject of study during the past year has been the Greek Tragedians and more especially Aeschylus. The members of the Seminary were required to present the results of their study and investigation in written and oral communications and the director and members met twice a week to hear and discuss these communications. Besides the usual exercises in textual criticism, exegesis and formal translation, reports were furnished on entire plays, a number of choruses were interpreted and their metrical structure analyzed, and a study was made of the tragic trimeter in the light of its value as an index to the chronology of the undated plays.

OTHER GRADUATE COURSES

Besides directing the Seminary, Professor Miller, throughout the year, conducted the following weekly courses:

1. Lectures on Greek Tragedy designed to supplement and give further direction to the work of the Seminary.

2. Readings in Aristotle's Poetics and Pseudo-Longinus' treatise on the Sublime.

3. Exercises in Greek Composition. This course was more than a series of exercises in the selection of vocabulary and special idiom, and in the correct use of accents, forms, and syntax. Style was throughout an element of prime consideration.

4. A course in Biblical and Patristic Greek. The whole of the *Διδαχὴ τῶν ἀποστόλων* was interpreted after the text had been read in class room from the facsimile plates of the Bryennios manuscript. Besides this, a careful study was made of more than twenty chapters of the *Σοφία Σεράχ*.

Professor Robinson conducted a course of reading in Plato's *Gorgias*, *Menexenus* and *Phaedrus*.

UNDERGRADUATE COURSES

Undergraduate courses were conducted as follows:

By Collegiate Professor Spieker:

Benner-Smyth's *Beginner's Greek Book*; Xenophon's *Anabasis*, I. *Three hours weekly through the year.*

Homer, *Iliad*, I, II. *One hour weekly through the year.*

Xenophon, *Memorabilia* (selections); Plato, *Apology*; Herodotus (selections); Prose Composition. *Four hours weekly through the year.* (Greek 1.)

Plato, *Protagoras*; Lyric Poets; Sophocles, *Antigone*; Prose Composition. *Three hours weekly through the year.* (Greek 3.)

Thucydides VII; Aristophanes, *Frogs*. *Two hours weekly through the year.* (Two-thirds of Greek 4.)

By Professor Robinson:

Greek Literature. *One hour weekly through the year.* (One-third of Greek 4.)

Undergraduates have read privately for examination the following:

Plato, *Crito*.

Euripides, *Alcestis*.

Homer, *Odyssey* (two books).

Demosthenes LIV and LV.

Elegiac and Iambic Poets.

PUBLICATIONS

B. L. Gildersleeve.

Paulus Silentarius. *American Journal of Philology*, xxxviii, 42-72.

On the Semantics of -GEN, *ibid.*, 200.

Brief Mention, xxxvii, 367-382; 494-505; xxxviii, 110-115; 222-227.

Brief Mention contains, among other things, discussions or notices of Greek Particles; Euripides; Lane Cooper's *Methods and Aims in the Study of Literature*; Sandys' *Scholars, Antiquarians and Bibliographers of the Nineteenth Century*; Gilbert Murray's *Diverse Ideals of English and German Scholarship*; Rendel Harris' *The Origin of the Cult of Aphrodite*; Paton's Translation of the *Fifth and Sixth Books of the Greek Anthology*; Pindar, i, 2, 8.; P. 2, 82; Persius, 5, 165-166; Bréal and the Homeric Question; A Puzzling Passage in one of Poe's Letters; Thomson's *Studies in the Odyssey*; Roberts' *Patriotic Poetry in Greek and English*; Achalmé's views of German achievements in physical science; Grotius' *Mare Liberum*.

C. W. E. Miller.

On the Use of the Article before the Genitive of the Father's Name in Greek Papyri. *American Journal of Philology*, xxxvii, 341-348.

Report on Rheinisches Museum für Philologie, lxx, 4. *ibid.*, xxxviii, 106-109.

Editorial work on the *American Journal of Philology*.

C. W. E. MILLER,
Professor of Greek.

HISTORY

SEMINARY IN AMERICAN HISTORY

The Seminary in American history was conducted by Professor Latané. The work of the year was devoted to the study of Anglo-American relations. Among the reports made were the following: "The Treaty of Versailles, 1783," by Elizabeth Merritt; "The Origin of the Policy of American Neutrality," by S. R. Gammon; "American Trade with the British West Indies," by Sallie A. Guerrant; "The United States and the Canadian Rebellion of 1837," by W. K. Gotwald; "The Acquisition of Oregon," by H. E. Corner; "British Interests in Cuba to 1854," by Ruth Tomlinson; "British Interests and Activities in Central America prior to 1850," by F. Bowers; "The Clayton-Bulwer Treaty (1850-1860)," by W. B. Schulz; "The Canadian Reciprocity Treaty of 1854," by C. C. Tansill; "The Enlistment Dispute between Great Britain and the United States during the Crimean War," by C. C. Thach; "The International Waterways between the United States and Canada," by J. K. Dunlap; "The Blockade of the Southern Confederacy as Affecting Relations with England," by A. Aston; "The Fur Seals Arbitration," by W. C. Guess; "The North Atlantic Coast Fisheries Dispute, 1818-1910," by Eleanor Diggs; "The Anglo-Venezuelan Boundary Controversy," by P. R. Fossum; "England and the Open-Door Policy in China," by H. Dorothy Welsh.

The following lecture courses were given by Professor Latané:

1. Anglo-American Diplomacy. *Two hours weekly, through the*

year. A study of the diplomatic relations of the United States and England from the American Revolution to the present time.

2. American History, for Undergraduates (History 4). *Three hours weekly, through the year.* A general course covering the whole field of American history, based on lectures, text-books, and assigned readings.

SEMINARY IN EUROPEAN HISTORY

Under the direction of Professor Vincent the Seminary of European History devoted the year to an intensive study of the period of Charlemagne. Topics were assigned to each member and reports of progress were rendered in frequent rotation. This field is not furnished with abundant material upon social and economic questions, consequently these investigations called for constant discrimination and the use of close historical reasoning.

Reports upon various phases of Carolingian civilization were given as follows:

Legal aspects of the land question, W. K. Gotwald.
Ordeals and evidence in legal procedure, P. R. Fossum.
Freemen and aristocracy, S. R. Gammon.
The servile classes, Elizabeth Merritt.
Architecture, W. B. Schulz.
Organization of the church, C. C. Tansill.
Agriculture, C. C. Thach.
Commerce, Ruth Tomlinson.

Professor Vincent's lectures to graduate students were in the field of mediaeval civilization, beginning with early Germanic society and continuing through the typical feudal period. Particular emphasis was laid upon the method of investigation required in this work.

The regular undergraduate class in European History was conducted as usual by Professor Vincent by means of text-books, informal lectures, and discussions. The present international situation emphasized more than ever the practical value of seeking the historical roots of modern conditions, as has been the regular practice in this class.

Attention may be called to the excellent collection of historical and topographical maps which Dr. Vincent has been gradually accumulating for the department, especially to the detailed military map of France, sections of which have been mounted and displayed in the Historical Reference Room with the entire battle line from the North Sea to Switzerland marked.

Dr. Ralph V. D. Magoffin conducted the following courses:

1. History of Greece from 404 to 146 B. C. *One hour weekly, through the year.* The work for the year was conducted from the point of view of the military, artistic, and social development of the time. The Greek Leagues were studied from the point of view of Roman extension and influence, and the Hellenistic period was handled from the various local points of view.

2. History of Italy and Rome from the earliest times to the patricio-plebeian amalgamation. *One hour weekly, through the year.* The late discoveries in the Terra Mare and Villa Nova civilization were examined and the spread of the Italian peoples was explained from linguistic and archaeological points of view. The work in the early republic centered about the history of Latium.

3. History of Greece and Rome,—for Undergraduates (History 1). *Three hours weekly, through the year.* The constitutional, political, social, economic, and artistic developments of Greece and Rome were traced by means of translated texts of the ancient historians with the aid of modern authorities. Reports on special topics, with map drawing on the part of the students and occasional lectures on the part of the instructor, served to expand and emphasize the important phases of this history.

Special Lectures. Professor Charles Downer Hazen, of Columbia University, gave a course of lectures to graduate students on European Diplomacy since 1815. *One hour a week from October to April.*

The lectures on the James Schouler Foundation were delivered in March by the Honorable David Jayne Hill, former ambassador to Germany. His subject was "International Readjustments;" and the six lectures, which were given in the Civil Engineering Building and were open to the public, attracted an audience which was larger than the hall could conveniently accommodate.

The lectures on the Albert Shaw Foundation were delivered in January by Dr. Payson J. Treat, Professor of Far Eastern History in Leland Stanford Jr. University. The subject of the ten lectures, which were delivered to graduate students in the departments of history and political science, was "Early Diplomatic Relations between the United States and Japan, 1853-1865." These lectures are now in press, and will shortly be issued by the University in book form. The Albert Shaw lectures, delivered in 1912 by Professor Isaac J. Cox, of the University of Cincinnati, will also be issued during the summer by the Johns Hopkins Press. These two volumes are being published under the editorial supervision of Professor Latané.

The dissertation of Dr. J. Miller Leake, entitled "The Virginia Committee System and the American Revolution," appeared as the first number of the thirty-fifth series of the Johns Hopkins University Studies in Historical and Political Science.

PUBLICATIONS

John H. Latané.

Review of Ellery C. Stowell and Henry F. Munro's "International Cases: Arbitration and Incidents Illustrative of International Law as Practiced by Independent States." *American Political Science Review*, February, 1917, pp. 146-148.

Review of T. Baty and J. H. Morgan's "War: Its Conduct and Legal Results." *American Journal of International Law*, April, 1917.

Sketch of Herbert B. Adams. *The News-Letter*, Nov. 7, 1916.

"The Monroe Doctrine and the American Policy of Isolation in Relation to a Just and Durable Peace." *Annals of the American Academy of Political and Social Science*, July, 1917.

"A History of the United States" (for high schools). Allyn and Bacon, Boston. (In press.)

Ralph V. D. Magoffin.

The Classical Conference at Columbia University. *Art and Archaeology*, vol. iv, 1916, p. 124.

Luigi Rossini, Engraver. *Art and Archaeology*, vol. v, 1917, pp. 200-212.

Current News and Notes. *Art and Archaeology*, vol. iii, No. 6, p. 359; vol. iv, No. 1, pp. 57-58; No. 2, pp. 124-125; No. 3, pp. 186-187; vol. v, No. 1, pp. 51-54; No. 2, pp. 120-122; No. 3, pp. 183, 184-185.

Reports. *Revue de Philologie*, vol. xxxviii. *American Journal of Philology*, vol. xxxviii, 1917, pp. 100-105.

Review of L. R. Dean's "A Study of the Cognomina of Soldiers in the Roman Legions." *American Journal of Philology*, vol. xxxvii, 1916, pp. 217-219.

Review of M. Clerc's "Histoire d'Aix-en-Provence dans l'antiquité." *American Journal of Philology*, vol. xxxvii, 1916, pp. 349-353.

Review of H. B. Van Hoesen's "Roman Cursive Writing." *American Journal of Philology*, vol. xxxvii, 1916, p. 354.

Review of E. S. Bouchier's "Syria as a Roman Province." *American Historical Review*, vol. xxii, 1916, pp. 193-194.

Review of H. O. Taylor's "Deliverance: The Freeing of the Spirit in the Ancient World." *The Classical Weekly*, vol. x, 1916, pp. 30-31.

Review of W. A. Oldfather and H. V. Canter's "The Defeat of Varus and the German Frontier Policy of Augustus." *The Classical Weekly*, vol. x, 1916, pp. 47-48.

Review of P. V. N. Myers's "Ancient History." *Art and Archaeology*, vol. v, 1917, p. 125.

Review of E. Cuq's "Une Statistique de locaux affectés à l'habitation dans la Rome impériale." *American Journal of Philology*, vol. xxxviii, 1917, pp. 96-98.

Review of Dio's Roman History, vol. iv (Loeb). *American Historical Review*, vol. xxii, 1917, pp. 693-694.

Review of M. A. Hamilton's "Outlines of Greek and Roman History to A. D. 180." Second edition. *The Classical Weekly*, vol. x, 1917, p. 198.

Review of W. G. Morey's "Ancient Peoples." *The Classical Weekly*, vol. x, 1917, p. 198.

Review of J. H. Breasted's "Ancient Times: A History of the Early World." *The Classical Weekly*, vol. x, 1917, pp. 199-200.

JOHN H. LATANE,
Professor of American History.

LATIN

The Seminary, which is the most important organ of graduate instruction, consists of the director, fellows, and such graduate students as have given satisfactory proof of their ability and training. Each year special attention is given to some one department of the literature. During the session just completed the centre of work has been the Roman Drama, more particularly Plautus and Terence. The members prepared papers founded upon special investigations, and presented in turn critical and exegetical commentaries upon given passages of those authors. Two meetings a week were held, through the year.

In addition to the Seminary course and the auxiliary work, Professor Smith lectured once a week through the year on Roman Comedy, once a week on Roman Tragedy, once a week on Historical Latin Syntax.

The members of the Seminary met once a week for the systematic reading of Plautus, Terence, and Seneca.

Undergraduate courses were conducted as follows:

Professor Smith:

Roman Literature (Latin III). *Weekly through the year.*

Collegiate Professor Mustard:

Latin I: Livy, bks. xxi and xxii (selections); Vergil, *Bucolics*; Horace, *Odes*; Latin Composition. *Four hours weekly, through the year.*

Latin IV: Plautus, *Trinummus*; Cicero, *First Tusculan* and *Somnium Scipionis*; Juvenal. *Two hours weekly, through the year.*

Latin IV: Advanced Latin Composition. *Weekly through the year.*

During the year Professor Smith has also given lectures or addresses on the following occasions: November 18, 1916, before the Archaeological Institute of America at the University of Rochester, on "Jason and Medea: A Psychological Study;" December 1, 1916, at the Friends' Meeting House in Baltimore, he gave the same lecture; December 12, 1916, he addressed the Circolo Italiano of Baltimore, on "Italia antiqua nell' Italia moderna;" December 14, 1916, he addressed the Men's Club of the Unitarian Church, Baltimore, on "Italy and the War;" January 9, 1917, he addressed the Men's Club of Christ Church, Baltimore, on "France in 1914;" January 16, 1917, he addressed the Men's Club of Franklin Street Presbyterian Church, Baltimore, on "The Artistic Use of Magic in Classical Literature;" April 28, 1917, before the Classical Club of Washington, he read his poem on "Numa and Egeria;" May 11, 1917, he addressed the Women's Club of York, Pa., on "The Agamemnon of Aeschylus."

Professor Mustard has delivered addresses on classical subjects before the Classical Section of the Virginia Educational Convention,

the Pennsylvania Society of the Archaeological Institute of America, the Maryland Branch of the Southern Association of College Women, and the Baltimore Classical Club.

PUBLICATIONS

Kirby Flower Smith:

Propertius: a Modern Lover in the Augustan Age. *The Sewanee Review*, xxv, no. 1, pp. 20-39.

Reviews of Mary Rebecca Thayer, The Influence of Horace on the chief English Poets of the Nineteenth Century, *Modern Language Notes*, xxxii, no. 4, pp. 240-242; Concetto Marchesi, Apulei Platonici Madaurensis, De Magia liber, testo critico con introduzione e commento, *American Journal of Philology*, xxxviii, pp. 203-4; H. E. Butler and A. S. Owen, Apulei Apologia. . . . With Introduction and Commentary, *American Journal of Philology*, xxxviii, pp. 204-5.

Report of the Rivista di Philologia xlv, fasc. 1-2. *American Journal of Philology*, xxxviii, pp. 218-221.

W. P. Mustard.

Notices, of Ettore Stampini, *Studi di letteratura e filologia latina*; M. R. Thayer, *The Influence of Horace on the chief English Poets of the Nineteenth Century*; *The Cambridge Songs, a Goliard Song Book of the XIth Century*, ed. Karl Breul; *Le Satire di Orazio*, ed. Vincenzo Ussani; William Jacob Keller, *Goethe's Estimate of the Greek and Latin Writers*; *Libri Tres De Calamitatibus Temporum B. Baptistae Mantuani*, ed. G. Wessels. *American Journal of Philology*, xxxviii, pp. 116-118.

Review of A Classical Dictionary of Greek and Roman Antiquities, Biography, Geography, and Mythology, ed. H. B. Walters. *American Journal of Philology*, xxxviii, pp. 211-212.

KIRBY FLOWER SMITH,

Professor of Latin.

MATHEMATICS

GRADUATE COURSES

Professor Morley gave the following courses:

1. Higher Geometry. *Three hours weekly, first half-year.*

Special attention was paid to the theory of the quartic curve in a plane, and to the analogous theory of the pencil of cubics.

2. Theory of Functions. *Three hours weekly, second half-year.*

The geometrical side was presented, and some physical applications were considered, notably Lery's extension of Kelvin's theory of images.

3. The Mathematical Seminary. *Weekly through the year.*

Associate Professor Coble gave the following courses:

1. Theory of Groups. *Two hours weekly, second half year.*
With applications to configurations and the theory of equations.
2. Theory of Probability. *Two hours weekly through the year.*
Including a study of the laws of dispersion and errors.

Associate Professor Cohen gave the following courses:

1. Elementary Theory of Functions. *Two hours weekly through the year.*

After a preliminary study of the theories of sequences and series, a study of functions of the complex variable, from both the Weierstrass and Cauchy points of view, was made.

2. Theory of Numbers. *Two hours weekly through the year.*

After a detailed study of the theory of rational numbers the theory of algebraic numbers was taken up and developed.

Dr. Bateman gave the following courses:

1. Mathematics for students of chemistry. *Three hours weekly through the year.*

The topics considered were: Differential and integral calculus. Method of least squares. Chemical statics and dynamics. Elementary thermodynamics and theory of solution.

2. Differential equations of mathematical physics. *Two hours weekly through the year.*

Laplace's equation was studied in connection with the theories of electrical and gravitational attraction. The equations of hydrodynamics were next considered and some attention was paid to vortex motion. Solutions of the equations of electromagnetism were obtained and interpreted physically and some time was spent on problems of electrical and aerial vibrations.

The undergraduate courses were given by Professors Hulburt, Coble, and Cohen, and Dr. Shenton.

The *American Journal of Mathematics* is in its 39th volume.

FRANK MORLEY,
Professor of Mathematics.

ORIENTAL SEMINARY

In the Oriental Seminary, under the direction of Professor Haupt, twenty-nine courses in the various departments of Oriental research were given during the past year, special attention being paid to the Old Testament and the cuneiform inscriptions bearing on the Scriptures.

Twenty-four hours during the first half-year, and twenty during the second, were devoted to the study of *Hebrew and the Old Testament*. In the *Old Testament Seminary*, two hours weekly, through the year, Professor Haupt gave a critical interpretation of *Selected Psalms* (especially Pss. 1, 2, 3, 4, 8, 13, 14, 15, 19, 20, 21, 22, 24, 53, 102) and of some sections in the Books of Isaiah and Jeremiah. He also conducted, through the year, a course in *Comparative Hebrew Grammar*, with special reference to the formations of the nouns, and gave a series of weekly exercises in *Hebrew Prose Composition*, the students translating idiomatic English sentences into Hebrew. Dr. Blake conducted a course in *Hebrew Phonology* during the first half-year, preceded by a sketch of the Elements of Phonetics, and gave, through the year, a series of lectures on *Hebrew Syntax* with special reference to the combinations formed by words and their modifiers. The instruction in *Elementary Hebrew* was given by Associate Professor Ember, three hours weekly, through the year. The course in *Second Year's Hebrew* was given in two sections, one being conducted by Associate Professor Ember, and the other by Dr. Blake, each two hours weekly, through the year. Dr. Rabinowitz gave the course in *Third Year's Hebrew*, two hours weekly, through the year. Dr. Rabinowitz also conducted courses in *Cursive Reading of the Hebrew Bible* and *Unpointed Hebrew Texts*, each one hour weekly, through the year, and in *Hebrew Conversation* during the first half-year. A series of *Hebrew Exercises* was conducted by Dr. Albright during the first half-year. Dr. Rosenau gave a course in *Post-Biblical Hebrew*, two hours weekly during the first half-year, and three hours weekly during the second, the students reading selections from the Mishna and the Talmud. Dr. Rosenau also lectured on the *History of Israel* during the first half-year, while two series of lectures on Biblical topics were given by Mr. Russell, one on *Biblical Archaeology*, and the other on *The Literature of the Bible* with special reference to date and authorship.

In *Biblical Aramaic* Dr. Blake met a class, through the year, for the study of *Biblical Aramaic Grammar* and the *Interpretation of the Aramaic Portions of the Book of Ezra*.

The lectures on the *History of the Ancient East* (Egypt, Babylonia, Assyria, Persia, Israel, Judah, and the minor nations of Western Asia, preceded by a sketch of the prehistoric period) were given, through the year, by Dr. Blake.

In *Arabic*, Professor Haupt conducted weekly exercises in *Arabic Prose Composition*. Associate Professor Ember gave courses in *Jewish Arabic* and in the *Makamat of Hariri*, each one hour weekly through the year. The instruction in *Elementary Arabic* was given by Dr. Albright, two hours weekly during the first half-year, and three hours weekly during the second.

In *Syriac* a series of exercises in *Syriac Prose Composition* was conducted by Professor Haupt.

In addition to weekly exercises in *Ethiopic Prose Composition*, conducted by Professor Haupt, a course in *Elementary Ethiopic* was given by Dr. Blake, both weekly through the year.

Five hours weekly, through the year, were devoted to the study of *Assyriology*. Professor Haupt conducted weekly, through the year, a course in *Assyrian Comparative Grammar* and exercises in *Assyrian and Sumerian Prose Composition*, the students translating some Goethian poems and a number of Hebrew Psalms into Assyrian and Sumerian. Dr. Duncan interpreted the *Code of Hammurabi*, while Dr. Albright conducted a course in *Assyrian Historical Inscriptions*, both through the year. The instruction in *Elementary Assyrian* was given by Dr. Albright, two hours weekly, through the year.

In *Egyptology*, Associate Professor Ember interpreted the *Pyramid Texts*, through the year, and also met a class, through the year, for the reading of selected *Hieratic Papyri*.

The instructors and advanced students of the Oriental Seminary met weekly, through the year, to present new discoveries and reports on important articles in the leading Oriental journals. The following original communications were presented:—Professor Haupt, Oct. 4: Heb. *az* = Ethiop. *enza*; Son of Man = gentleman; Assyr. *amili*, man, and Heb. *'amal*, to work; Heb. *zait*, olive, and Arab. *zawd*, to wrinkle.—Oct. 12: The Sumerian litanic dialect; Sum. *giš*, man, as an indefinite pronoun.—Oct. 19: Heb. *kilyā*, kidney, the encapsuled organ.—Nov. 2: Assyr. *surriš*, quickly, and Arab. *sara'a*, to hasten: Assyr. *samar*, immediately, and Arab. *ramaza*, to wink.—Nov. 16: Sumerian and the Caucasian languages; Assyr. *marā* and *camtu*.—Nov. 23: Heb. *'agēth*, festal assembly, and Arab. *'ard*, military review.—Dec. 6: An Arabic parallel to Jonah's whale.—Dec. 13: Assyr. *maruštu*, misery, and Arab. *raththa*, be old and worn; Sumer. *gibil*, fire-new.—Dec. 20: Arab. *daššara*, forsake, and Assyr. *umdāššer*; Assyr. *mašāru*, to cut, forsake = Arab. *wašara*, to saw; Babylonian origin of the story of the Treasury of Rhampsinitus; Heb. *nefillim*, destroyers, Titans.—Jan. 4: Heb. *lō-ma'n tādē*, that Thou mayest be praised, Ps. 130, 4.—Jan. 11: Crystal-gazing among the Hebrews; Heb. *kt'im*, but, after a negative; Semitic impersonal passives; St. George's dragon.—Jan. 18: Archæological parallels to Babylonian temple-towers.—Jan. 25: The preposition *ina* in Ethiopic.—Feb. 1: Talmudic *inēš*, man = Assyr. *nešu*, people.—Feb. 8: The breaking of the pitcher, Eccl. 12, 6 = cerebral hemorrhage, and the breaking down of the wheel = stoppage of the action of the heart.—March 29: Hebrew words for *gold*; Greek *Tethys* = Babylon. *Tiāmat*.—April 19: Assyr. *pitru*, rubbish = Syr. *purraṭhā*, crumbling; Heb. *yaggāh* for *tēnā* in Ps. 8, 2.—April 26: Heb. *mašal*, to shine, rule, be similar; Heb. *tēšārā*, present, miswritten for Heb. *tēmārā* = Assyr. *tamārtu*; Assyr. *ikkibā kālu*, to transgress.—May 3: Arab. *thamala*, to stand by, aid, and Assyr. *šamallā*, helper; Assyr. *šalummatu*, shine, and Arab. *mathula*, to be eminent.—May 17: Heb. *šamar*, to watch, to rage, originally to stare.

Associate Professor Ember, Nov. 23: Egyptian *y'bw*, left = sinister, evil; Eg. *šf*, fragrance = Heb. *šuk*, to anoint; Eg. *nfr*, good = Bedauey

enfer, be sweet; Eg. *fdwt*, sweat = Bedauye *dāf*, Arab. *dāf*, heat; Eg. *yb*, goat = Bedauye *ab*; Eg. *hms*, phallus = Heb. *homš*, abdominal region.—Dec. 20: Semitic words preserved in Egyptian sign-values.—Jan. 11: Eg. *š*, cut = Arab. *wašara*; Eg. *šwy*, be dry = Arab. *šawš*, roast; Eg. *y'h*, be dry = Heb. *rāh*, wind.—Jan. 18: Eg. *s'*, hog = Heb. *šē*, sheep.—Jan. 25: Arab. *amala*, hope, and *māla*, incline; Heb. *šiwwa'*, cry for help, and **yāšā'*, help; Eg. *m's* blade, and Arab. *māsa*, shave; Eg. *dw'*, pray = Arab. *da'a*, call.—Feb. 8: Eg. *šr*, giraffe = Heb. *šōr*, bull; Eg. *yf*, flesh, and Heb. *afš*, bake.—March 29: Eg. *šn*, arrow, and *šnt*, spear-head = Arab. *šindn*; Eg. *šwn*, arrow = Heb. *šain*, weapon; Eg. *ššr* (*šhr*) = Heb. *šēlš*, lance; Eg. *gmht*, front of the head = Arab. *jabhat*, forehead.—Apr. 19: The sacred poles of Osiris and Asherah.—May 17: Eg. *š* originally *k*; Eg. *mdw* = Heb. *bad*.

Dr. Rosenau, Feb. 1: A new English translation of the Hebrew Bible; Talmudic *dīqā* and Greek *deiknymi*.

Dr. Blake, Oct. 4: The Heb. *nota accusativi* and Heb. *yēš*, existence.—Nov. 16: Coordination in the Philippine languages.—Jan. 4: Heb. *kt'im*, but, after a negative.—Jan. 18: Indo-European analogies to Heb. *kt*, *kē*, verily.—March 1: Conditional particles in Semitic.

Dr. Albright, Nov. 2: Assy. *edlu*, man = South. Arab. *asad*.—Nov. 16: Twenty cases where Egyptian *t* = Semitic *š*.—Dec. 20: Assy. *narābu*, to swell.—Jan. 18: *Engidu-Šakan*, the Babylonian genius of fertility.—Jan. 25: The Babylonian Noah as the prototype of Solomon in the Wisdom-literature; Association of the moon with fertility in Egypt.—Feb. 8: Egypto-Semitic etymologies.—March 1: The Source of the Rivers in Mesopotamian cult and mythology.—March 29: the name of the Assyrian god *Ninurtu*.—April 19: Assy. *rittu*, hand = Egypt. *rd*, Arab. *mirdāt*; Assy. *šemu* = Arab. *šām*, grease; Eg. *spr*, arrive = *adripare*; A passage in the Langdon epic.—May 3: The fire-gods *Gibil mār apš* and *Apām-napāt*.—May 17: Assy. *batālu*, youth = Ethiop. *batr*, rod; Egypt. *šbk*, Crocodile-god = Arab. *samak*, fish; Arab. *samak* = the *spawner*.

Dr. Seidel, Jan. 25: The Targum to Gen. 48, 22.

Mr. Bloomhardt, May 3: The etymology of *anāku*, I.

In addition to these original communications the following reports were presented:—Professor Haupt, The meeting of the Society of Biblical Literature at Haverford; The meeting of the Oriental Society at Boston; Torrey's explanation of the Koranic *raqīm* and the story of the Seven Sleepers.—Vol. xxxiii, Number 3 of *The American Journal of Semitic Languages and Literatures*.—Dr. Rosenau: Friedländer's *Pirke de Rabbi Eliezer*; Husik's *History of Medieval Jewish Philosophy*; English translations of Biblical Hebrew.—Mr. Bloomhardt, The Kaaba in Mecca.

At the meetings of the University Philological Association the following communications were presented by members of the Oriental Seminary: Professor Haupt, Oct. 20: Field and Well = Wife; Nov. 17: The First and Second Persons in Sumerian; Dec. 15: The German term *Schweizerdegen*, The Etymology of *Kidney*, The Sperm-whale in the Book of Jonah; Jan. 19: The Prænestine Temple-pyramid; Feb. 16: The Scream of St. George's Dragon; March 16: The Impersonal

Passive in Latin; May 18: Was Teumann epileptic or apoplectic?—Associate Professor Ember, Jan. 19: Egyptian *'wj*, to be long = Heb. *'iswâ*, to desire; April 20: Asherah and Osiris.—Dr. Albright, Dec. 15: The Egyptian names of the Barks of Morning and Evening; Feb. 16: The Lunar Ship in the Langdon epic; March 16: Anatolian Ass- and Vine-deities in Mesopotamia.

At the annual meeting of the Society of Biblical Literature and Exegesis, held at Haverford, Dec. 27-28, Professor Haupt read the following papers: (a) Alcohol in the Bible; (b) Rhabdomancy and Belomancy in the Old Testament; (c) The Language of the Sumerian Penitential Psalms; (d) Ur of the Chaldees.

At the General Meeting of the American Philosophical Society, Philadelphia, April 12-14, Professor Haupt presented a paper on The Waters of Death.

Eleven papers were presented by members of the Oriental Seminary at the annual meeting of the American Oriental Society, held in Boston, April 10-12, *viz.*, Professor Haupt: (a) Semites, Hebrews, Israelites, Jews; (b) The Son of Man; (c) The Last Words from the Cross; (d) The Babylonian Origin of the term *Naphtha*.—Associate Professor Ember: (a) New Semito-Egyptian Words; (b) Some African Words in Old Egyptian.—Dr. Blake and Associate Professor Ember: A new Hebrew grammar.—Dr. Blake: The Etymology of the Semitic Particle *ka*, like; (b) The Compound Particle *ki'im* in Hebrew.—Dr. Albright: (a) Gilgames and Engidu, Babylonian Genii of Fertility; (b) Mesopotamian Vine-goddesses.

The most pressing needs of the Oriental Seminary are:

(1) the appointment of an Assyriologist to the chair of Oriental History and Archæology;

(2) a less inadequate appropriation for new books in the various departments of Oriental research, including Assyriology, Egyptology, Biblical Philology, Oriental History and Archæology, Hebrew, Talmud, Rabbinical Literature, Arabic, Persian, Turkish, Jewish Aramaic, Syriac, Ethiopic, Amharic, Phœnician, Sabeian, Philippine dialects, etc., etc.

PUBLICATIONS

Paul Haupt.

Assyr. *mûr-nisqi*, war-horse. *American Journal of Semitic Languages and Literatures*, vol. xxxiii, pp. 45-47.

Assyr. *rabû*, to sink = Heb. *raphû*. *American Journal of Semitic Languages and Literatures*, vol. xxxiii, p. 48.

The Curse on The Serpent. *Journal of Biblical Literature*, vol. xxxv, pp. 155-162.

Christopher Johnston. *Journal of the American Oriental Society*, vol. xxxvi, pp. 339-341.

Askari, soldier, and Lascar, sailor. *Journal of the American Oriental Society*, vol. xxxvi, pp. 417-418.

Well and Field = Wife. *Journal of the American Oriental Society*, vol. xxxvi, pp. 418-420.

- Sumerian *tu*, dove, and *nam*, swallow. *Journal of the Society of Oriental Research*, vol. i, pp. 3-9.
- Hebrew *az* = Ethiopic *enza*. *Journal of the Society of Oriental Research*, vol. i, pp. 41-44.
- Was Amos a Sheepman? *Journal of Biblical Literature*, vol. xxxv, pp. 280-287.
- Heb. *galáth šólēmā*, a peaceful colony. *Journal of Biblical Literature*, vol. xxxv, pp. 288-292.
- The Biblical phrase "to ordain a lamp." *Journal of Biblical Literature*, vol. xxxv, p. 319.
- Heb. *awwóth náff*, rut, heat. *Journal of Biblical Literature*, vol. xxxv, pp. 319-320.
- Heb. *šegál*, queen = Arab. *thajlá'*. *Journal of Biblical Literature*, vol. xxxv, 320-322.
- Aram. *lēbēnā*, concubine. *Journal of Biblical Literature*, vol. xxxv, pp. 322-324.
- The Son of Man (Abstract). *Journal of the American Oriental Society*, vol. xxxvii, p. 14.
- The Last Words from the Cross (Abstract). *Journal of the American Oriental Society*, vol. xxxvii, p. 21.
- The Babylonian Origin of the term Naphtha (Abstract). *Journal of the American Oriental Society*, vol. xxxvii, p. 21.
- Field and Well = Wife. *Johns Hopkins University Circulars*, No. 296, pp. 30-31.
- The First and Second Persons in Sumerian. *Johns Hopkins University Circulars*, No. 296, pp. 34-35.
- The German term *Schweizerdegen*. *Johns Hopkins University Circulars*, No. 296, pp. 35-36.
- The Etymology of *Kidney*.—*Johns Hopkins University Circulars*, No. 296, p. 36.
- The Sperm-Whale in the Book of Jonah. *Johns Hopkins University Circulars*, No. 296, pp. 36-37.
- The Prænestine Temple-Pyramid. *Johns Hopkins University Circulars*, No. 296, pp. 39-40.
- The Scream of St. George's Dragon. *Johns Hopkins University Circulars*, No. 296, pp. 42-43.
- The Impersonal Passive in Latin. *Johns Hopkins University Circulars*, No. 296, pp. 44-45.
- Was Teumann epileptic or apoplectic? *Johns Hopkins University Circulars*, No. 296, pp. 50-51.
- Hebr. *natán*, geben, im Arabischen und Äthiopischen. *Zeitschrift der Deutschen Morgenländischen Gesellschaft*, vol. lxix, p. 564.
- Armenisch *g* für *w*. *Zeitschrift der Deutschen Morgenländischen Gesellschaft*, vol. lxix, pp. 564-565.
- Das aramäische Ittafal ein Inta'al. *Zeitschrift der Deutschen Morgenländischen Gesellschaft*, vol. lxix, pp. 565-566.

Aaron Ember.

- Egyptian 'wj, to be long, stretch out = Hebrew 'יָמַד, desire (Abstract). *Johns Hopkins University Circulars*, No. 296, pp. 38-39.
- Asherah and Osiris (Abstract). *Johns Hopkins University Circulars*, No. 296, pp. 48-49.
- A New Hebrew Grammar (Abstract). *Journal of the American Oriental Society*, vol. xxxvii, p. 10 (with Frank R. Blake).
- New Semito-Egyptian Words (Abstract). *Journal of the American Oriental Society*, vol. xxxvii, p. 21.
- Some African Words in Old Egyptian (Abstract). *Journal of the American Oriental Society*, vol. xxxvii, p. 21.

Frank R. Blake.

- Construction of Coördinated Words in the Philippine Languages. *American Journal of Philology*, vol. xxxvii, pp. 466-474.
- The Interrogative Particle *a* in Hebrew. *American Journal of Semitic Languages and Literatures*, vol. xxxiii, pp. 146-148.
- The Dual Ending *-aim* in the Hebrew Multiplicative Numerals. *American Journal of Semitic Languages and Literatures*, vol. xxxiii, pp. 148-149.
- The Tagalog Verb. *Journal of the American Oriental Society*, vol. xxxvi, pp. 396-414.
- A New Hebrew Grammar (Abstract). *Journal of the American Oriental Society*, vol. xxxvii, p. 10 (with Aaron Ember).
- The Etymology of the Semitic Particle *ka*, like (Abstract). *Journal of the American Oriental Society*, vol. xxxvii, p. 10.
- The Compound Particle *ki-'im* in Hebrew (Abstract). *Journal of the American Oriental Society*, vol. xxxvii, p. 10.

W. F. Albright.

- The Eighth Campaign of Sargon. *Journal of the American Oriental Society*, vol. xxxvi, pp. 226-232.
- The Egyptian Name of the Solar Bark of Morning and Evening (Abstract). *Johns Hopkins University Circulars*, No. 296, p. 34.
- The Lunar Bark in the Langdon Epic (Abstract). *Johns Hopkins University Circulars*, No. 296, p. 38.
- Anatolian Ass- and Vine-deities in Mesopotamia (Abstract). *Johns Hopkins University Circulars*, No. 296, pp. 45-46.
- Gilgames and Engidu, Babylonian Benii of Fertility (Abstract). *Journal of the American Oriental Society*, vol. xxxvii, p. 16.

PAUL HAUPT,

W. W. Spence Professor of the Semitic Languages
and Director of the Oriental Seminary.

PHILOSOPHY

GRADUATE COURSES

Courses have been given during the year by Professor Lovejoy on the Philosophical Ideas of the Eighteenth Century; on the Conception of Consciousness in the Light of the Problem of Perception; and on Political Philosophy. The last-mentioned course, designed largely for students in Political Science, was given to help fill, in part, the gap caused by Professor Willoughby's absence. It was primarily a historical course on political theories from Hobbes to the early nineteenth century. Dr. Slonimsky gave, throughout the year, a course on the Philosophy of Plato and Aristotle, and during the summer session a course on Typical Views of Life.

It is customary for the American Philosophical Association to devote the greater part of each of its annual meetings, during the Christmas holidays, to a discussion of a special philosophical topic selected and announced in advance. This department has, for several years, made a point of devoting at least a part of one of its graduate courses to the Association's topic, both with a view to adding to the interest and profitableness of the courses, and also to furthering a more effectual coöperation in connected inquiry among American students of Philosophy. The topic chosen for this year's meeting is "Ethics and International Relations," and the opening part of the course announced for 1917-18 under the title of "The Ethical Theory of Distribution" will be devoted to this topic. This course is intended to be of service to students of Political Science and Economics, as well as to those specializing in Philosophy.

PUBLICATIONS

Arthur O. Lovejoy.

The Meaning of "Romantic" in Early German Romanticism.

Part I. *Modern Language Notes*, xxxi, 1916, pp. 385-396;

Part II. *Ibid.*, xxxii, 1917, pp. 65-77.

Topic for Discussion at the 1916 Meeting of the American Philosophical Association. *Journal of Philosophy, Psychology and Scientific Methods*, xiii, 1916, pp. 573-581.

On Some Conditions of Progress in Scientific Inquiry (Presidential Address before the Sixteenth Annual Meeting of the American Philosophical Association). *Philosophical Review*, xxvi, 1917, pp. 123-163.

The Future of the Carnegie Foundation. *The Nation*, ciii, 1917, pp. 417-419.

Academic Freedom. *The Nation*, ciii, 1916, p. 561.

America Impartial. *New Republic*, x, 1917, p. 75.

Benevolent Neutrality? *New Republic*, x, 1917, pp. 229-230.

To Conscientious Objectors. *New Republic*, xi, 1917, pp. 187-189.

(With C. A. Kofoed, G. H. Marx, F. M. Padelford) Report of Committee of Inquiry on Alleged Violations of Academic Freedom at the University of Montana. *Bulletin of the American Association of University Professors*, May, 1917, Part II, 52 pp. Notice of Miller's "Bergson and Religion." *The Nation*, ciii, p. 326.

A. O. LOVEJOY,
Professor of Philosophy.

PHYSICS

The Physical Laboratory has been open daily during the year for the work of advanced and undergraduate students. Regular courses of lectures have been given, and meetings had been held weekly for the reading and discussion of the current journals. The Physical Seminary has met once a week and the list of papers presented is given below.

The regular courses of instruction were as follows:

By Professor Ames:

1. Physical Seminary. *One hour weekly, through the year.*
2. General Physics: Theoretical Mechanics. *Four hours weekly, through the year.*
3. Undergraduate Physics I. *Three hours weekly, through the year.*
4. Journal Meeting *One hour weekly, through the year.*

By Professor Wood:

Physical Optics. *Three hours weekly, through the year.*

By Professor Bliss:

1. Undergraduate Physics III: Electricity and Magnetism. *Three hours weekly, first half-year.*
2. Undergraduate Physics II: Mechanics. *Three hours weekly, second-half year.*

By Associate Professor Pfund:

1. Undergraduate Physics II: Wave-motion. *Three hours weekly, first half-year.*
2. Undergraduate Physics III: Optics. *Three hours weekly, second half-year.*

By Dr. MacKenzie:

General Astronomy. *Three hours weekly, through the year.*

The work in undergraduate Physics I, II and III was carried out

in part by several assistants: Dr. A. F. Gorton, Mr. F. L. Mohler, Mr. S. M. Burka and Mr. H. L. Dryden.

The laboratory work for undergraduates has been under the direction of Professor Bliss and Dr. Pfund, with the assistance of Dr. Gorton and Messrs. Mohler, Burka and Dryden. The work in the Astronomical Observatory was under the direction of Dr. MacKenzie. The advanced work and the original investigations have been under the direction of Professors Ames, Wood and Pfund.

In the Physical Seminary papers were read as follows:

Miss L. Wilson—Life of Huygens; Modern Theory of the Mechanics of the Atmosphere.

Mr. W. F. Meggers—Measurement of wave-length; Modern practice in "wireless."

Mr. F. L. Mohler—Copernicus, Tycho Brahe and Kepler; Contact Electricity.

Mr. V. Voss—History of the Principle of Virtual Work; Emission of electrons by hot bodies.

Mr. S. M. Burka—Early work in Hydrodynamics; Instruments for measurement of air-pressure.

Mr. R. A. Castleman—Lives of Hooke and Boyle.

Mr. L. H. Crook—Lives of Descartes and Leibnitz; Colloids.

Miss M. D. Darkow—Lives of Torricelli and Pascal.

Mr. H. L. Dryden—Work in Mechanics before Galileo; Principles of Aeronautics.

Mr. M. Koulisover—Early work in Pneumatics.

Mr. E. H. Lange—Life of Newton.

Mr. H. L. Moore—Lives of Stevinus and da Vinci.

Mr. F. L. Robeson—Life of Galileo.

Mr. W. W. Steffey—History of Mechanical Apparatus.

There were fifteen advanced students who followed Physics as their principal subject. Of these four absolved the requirements for the degree of Doctor of Philosophy, and one those for the degree of Master of Arts, their names and the titles of their dissertations and essay being as follows:

Mr. W. F. Meggers—Wave-length Measurements in Spectra from 5600 Å to 9600 Å.

Mr. F. L. Mohler—Resonance Radiation of Sodium Vapor excited by one of the *D* lines.

Mr. V. Voss—The Ratio of the Intensities of the *D* lines of Sodium.

Miss L. Wilson—The Structure of the 2536 Mercury Line.

Mr. R. A. Castleman—The History of Diffraction. [Essay]

Upon the declaration of war against Germany Dr. MacKenzie was called into service as an Ensign in the Naval Reserves; Mr.

Voss entered the British Flying Corps in Toronto; and six other graduate students accepted appointments in the laboratories of the government, several of them not being eligible for military service. Four, who could not enter the Army or Navy, accepted positions as teachers for the coming year.

In April Professor Ames was appointed by the National Research Council the Chairman of a committee of six to go to Europe in order to investigate the progress in Science in France and England since the beginning of the War in 1914, to learn the ways in which science was being applied to military purposes, and to offer the services of the Research Council in any line of scientific work in which it could be useful. This committee was in Europe for two months.

Two Japanese professors, Messrs. M. Kimura and S. Okano, were guests of the department during the year, working in co-operation with Professor Wood upon several important physical properties of sodium vapor and iodine vapor.

Dr. Pfund's researches were largely in the field of Photoelectricity. He also, at the request of one of the Government Bureaus, undertook a study of the cause of the color in various sea shells. He was able to find the explanation as the result of some extremely ingenious experiments.

All these investigations have led to papers which have been published or are in process of publication. The other work of the laboratory is indicated in the titles of the dissertations submitted as given above.

JOSEPH S. AMES,

Director of the Physical Laboratory.

ANIMAL PHYSIOLOGY

The following scheduled courses were given during the session of 1916-17:

1. The Physiology of Digestion, Secretion and Nutrition. Professor Howell. *Twice weekly during the fall trimester.*
2. The Physiology of Muscle and Nerve and of the Special Senses. Professor Howell. *Three times weekly during the first half of the winter trimester.*
3. Physiological Conferences. Professor Howell. [The first-year class in medicine.] *Once weekly during the winter trimester.*
4. The Physiology of Blood, Circulation, and Respiration. Associate Professor Hooker. *Twice weekly during the spring trimester.*
5. The Physiology of the Central Nervous System. Associate Professor Snyder. *Three times weekly during the second half of the winter trimester.*
6. Laboratory Courses in Experimental Physiology Drs. Howell,

Hooker, Snyder, and Cobb, Mr. Lynch and Mr. Sosman. *Twelve hours weekly during the fall and spring trimester.*

7. Journal Club. Professor Howell. *Once weekly throughout the year.* This exercise was attended by the staff in Physiology, by certain members of the staff in other departments, and by advanced and special students.

INVESTIGATIVE WORK

In addition to carrying on the elementary courses for medical students, the members of the staff have all been engaged in physiological research, and under their direction several special students have carried out experimental investigations as follows:

Mr. Vernon Lynch—A study of the conditions for maintenance and growth in unicellular animals.

Mr. Jay McLean—The use of cephalin in controlling hemorrhages.

Mr. A. R. Rich—The nature and properties of metathrombin.

Miss Madge Thurlow—The effect of diet upon the reaction of the blood.

Dr. Tsugane—A study of the vaso-motor reactions of the veins.

Mr. H. M. Winans—Effect of temperature changes upon the activity of the medullary centres.

Mr. W. C. Huyler—The heat production of the heart-beat.

Mr. M. L. Breitstein—The heat production of the stomach muscle stimulated through the vagus nerve.

PUBLICATIONS

W. H. Howell.

Harvey lecture upon the coagulation of the blood. April 7, 1917.

The relation of medical studies to the higher degrees given in the University. *Association of American Universities*, Worcester, 1916.

D. R. Hooker.

The perfusion of the mammalian medulla: Note on the action of ethyl alcohol. *Journal of Pharm. and Exp. Therapeutics*, vol. x, 1917.

The perfusion of the mammalian medulla: The effect of carbon dioxide and other substances on the respiratory and cardiac vascular centres. (With D. W. Wilson and Helene Connet.) *American Journal of Physiology*, vol. xliii, 1917.

The perfusion of the mammalian medulla: The action of the bromides, iodides, and nitrates on the respiratory center. (With D. I. Macht.) *American Journal of Physiology* (in press).

C. D. Snyder.

On the heat liberated by the beating heart. *American Journal of Physiology*, vol. xliiv, 1917.

A. R. Rich.

The changes in clotting power of an oxalated plasma on standing. *American Journal of Physiology*, vol. xliii, 1917.

The nature and properties of metathrombin. *American Journal of Physiology*, vol. xliii, 1917.

H. G. Fisher.

The histology of the M. retractor penis of the dog. *Anatomical Record* (in press).

W. H. HOWELL,
Professor of Physiology.

POLITICAL ECONOMY

The instruction in Political Economy was directed by Professor Hollander, who met students daily in seminary organization for formal study and for co-operative research. The courses were designed to afford systematic instruction in general economic principles, intimate acquaintance with special fields of economic activity, and, most important of all, knowledge of and ability to employ sound methods of economic research. Dr. George E. Barnett, Professor of Statistics, assisted in the conduct of the work.

Economic Seminary. The students following political economy as a principal subject for the degree of Doctor of Philosophy met weekly under the direction of Professors Hollander and Barnett. The work of the year centered in the investigation of representative forms of industrial development in the United States, and in the analysis of significant activities of American labor organizations. The papers and reports presented to the Seminary were as follows: "Capitalization of the New Industrials," by Kemper Simpson; "Labor Disputes in the Lumber Industry," by H. F. Holtzclaw; "The Financing of Cotton Mills in the South," by Broadus Mitchell; "Railroad Pension Systems," by Professor Barnett; "Labor Conditions in the Lumber Industry," by H. F. Holtzclaw; "The Securities of the New Industrials," by Kemper Simpson; "The Influence of Foreigners in the Brewery Workers' Union," by Joshua Bernhardt; "The History of Pension Systems in American Trade Unions," by Rev. John O'Grady; "Industrial Conflicts in the Steel Trade," by J. S. Robinson; "The Working day in the Carpenters' Union," by J. H. McKean; "Social Aspects of Trade Unionism," by C. E. Burgee; "The Standard Rate in the Iron and Steel Trade," by J. S. Robinson; "Economic Aspects of the New Industrial Flotations," by Kemper Simpson; "The Financing of the Southern Cotton Mills," by Broadus Mitchell; "The Inheritance Tax in Japan," by Kenichi Abe; "Profit Sharing in the United States," by Boris Emmet; "A Graphic Representation of the Ricardian Theory of Rent," by Joshua Bernhardt; "The Taxation of Sugar in Great Britain," by T. Yoshikawa; "A Comparison of the Tenets of John Locke and of Henry George with respect to Private Property in Land," by Broadus Mitchell; "The Marketing of the Stock of the New Industrials," by

Kemper Simpson; "The Minimum Cost of Living in Japan," by Dr. K. Morimoto; "A Suggestion for the Study of the Economic History of the South by this Seminary," by Broadus Mitchell; "The Van de Weyr Collection of Senior's Pamphlets," by Broadus Mitchell.

Appreciable progress has also been made by members of the Seminary in the study of special aspects of the several questions assigned for investigation. During the summer field work was carried on in various carefully selected localities, and the data thus collected have since been supplemented and corrected by documentary study and personal interview.

Professor Hollander conducted the following courses of lectures:

1. The Development of Economic Opinion. *Two hours weekly during the year.* A critical survey was made of the historical development and present state of representative economic doctrines.

2. The Theory and Practice of Taxation. *Two hours weekly during the year.* The history of taxation was examined with reference to recent expenditures and present requirements in the United States.

Professor Barnett lectured during the year on labor legislation with particular reference to social insurance.

A reading class was organized and successfully conducted by the more advanced students of the department for the co-operative study of economic texts and for the critical discussion of current literature.

The Seminary collection of economic texts was strengthened by purchases from the Hutzler fund, the McPherson fund and the Glenn fund.

Professor Hollander and Professor Barnett conducted the following undergraduate courses:

Political Economy I. *Three hours weekly, through the year.* In the first half-year the industrial development of England and the United States was studied. In the second half-year systematic instruction was given in the elementary principles of economic science.

Political Economy II. *Three hours weekly, through the year.* In the first half-year the theory and practice of finance were considered. In the second half-year the principles of monetary science were taught.

Political Economy III. *Three hours weekly, through the year.* In the first half-year the theory and methods of statistics were given in advanced economic theory. In the second half-year study was made of the causes and treatment of poverty.

The prime purpose of the department of Political Economy is to train qualified students in methods of economic research so that either as teachers or as investigators they may add to the sum of human knowledge in the field of economic relations. It is believed—and this constitutes the distinctive characteristic of economic study at Johns Hopkins—that this training can only be successfully given by the student's coming into immediate contact, through observation and interview, under proper guidance, with actual economic facts. A quasi-historical study based exclusively upon documentary

material and library apparatus will not afford this training. The student must be trained to investigate and understand the actual working of an existing economic institution.

The successful conduct of economic instruction of this kind requires the use of a Research Fund, comparable to the laboratory appropriations available in the natural sciences. It is required to some extent for the collections of documentary material essential to such investigations, but lying beyond the range of ordinary library purchases. The larger occasion for such a fund is, however, to enable the students at a certain period in their training to continue their investigations by actual field work, this involving repeated visits to and frequent residence in the particular localities where the phenomena under investigation are found in typical form. Without the aid of such a fund the ordinary student is practically obliged to limit his inquiry to a local phenomenon or to remain content with an imperfect induction.

The Johns Hopkins University will offer during the academic year 1917-18, in continuation of the courses given during the past year, a series of evening "Courses in Business Economics," under the general direction of the Department of Political Economy. Such instruction is made available at hours and under conditions designed to meet the convenience of those likely to make use thereof. While designed in the main to offer instruction to young men and women actually engaged in, or contemplating entrance into, business, industry and commerce, the courses will be planned to meet the needs, also, of those who have a more general interest in the subjects.

PUBLICATIONS

G. E. Barnett:

Growth of Labor Organization in the United States 1897-1914. *Quarterly Journal of Economics*, August, 1916, pp. 780-795, 837-846.

[with D. A. McCabe] Mediation, Investigation and Arbitration in Industrial Disputes. D. Appleton & Company, 1916, pp. viii, 209.

JACOB H. HOLLANDER,
Professor of Political Economy.

POLITICAL SCIENCE

During the absence of Professor Willoughby, who spent the year in Peking as constitutional adviser to the Chinese government, the Political Science Seminary was conducted by Professor Latané. The general topic for reports and discussions was "Problems of International Law arising out of the European War." Among the papers presented were the following: "The Status of the Declaration of London," by J. T. Carter; "Contraband and the Present War," by R. Howell; "The British 'Blockade' of Germany," by D. Richardson; "Belligerent Interference with Mails," by B. Wil-

liams; "The Status of Armed Merchantmen," by H. M. Blalock; "Detention and Search," by A. S. Jewett; "Japan's Relation to the European War," by G. Wan; "Dollar Diplomacy," by E. T. Fell.

The following lecture courses for graduate students were offered:

1. United States Constitutional Law. *Two hours weekly through the year.* President Goodnow.
2. Anglo-American Diplomacy. *Two hours weekly through the year.* Professor Latané.
3. English Political Philosophy since Locke. *One hour weekly through the year.* Professor Lovejoy.

JOHN H. LATANÉ.

PSYCHOLOGY

During the year 1916-1917 advanced courses in objective psychology and experimental psychology were conducted by Professor Watson. Professor Dunlap gave courses in introductory general psychology, experimental psychology and the history of psychology. Professor H. C. Warren, of Princeton University, gave a course in genetic psychology. Dr. Lashley conducted a course in animal behavior.

PUBLICATIONS

John B. Watson:

The Psychology of Wish Fulfilment. *Scientific Monthly*, November, 1916, 479-487.

Behavior and the Concept of Mental Disease. *Jour. Philos., Psy. and Scientific Methods*, October 26, 1916, 589-597.

Does Holt follow Freud? *Jour. Philos. Psy. and Scientific Methods*, vol. xiv, 85-92.

Emotional Reactions and Psychological Experimentation. *American Jour. of Psy.*, April, 1917, 163-175. (With J. J. B. Morgan.)

The Effect of Delayed Feeding upon Learning. *Psychobiology*, vol. i, 1917.

Practical and Theoretical Problems in Instinct and Habit. (Address before Joint Committee on Education of Chicago, February 17, 1917).

Edited *Journal of Experimental Psychology*, 1916.

Edited *Animal Behavior Monographs*, 1914.

Knight Dunlap:

A New Complication Apparatus. *Jour. Exp. Psychol.*, 1917, ii, pp. 89-91.

The Stuttering Boy. *Jour. Abnor. Psychol.*, 1917.

The Johns Hopkins Chronoscope. *Jour. Exp. Psychol.*, 1917, ii, pp. 241-252.

Internal Secretion in Learning. *Psychobiology*, i, pp. 61-64.

K. S. Lashley:

Retroactive Association and the Elimination of Errors in the Maze. *Jour. Animal Behav.*, 1917, 7, 130-138. (With Helen B. Hubbert.)

The Criterion of Learning in Experiments with the Maze. *Jour. Animal Behav.*, 1917, 7, 66-70.

A Causal Factor in the Relation of the Distribution of Practice to the Rate of Learning. *Jour. Animal Behav.*, 1917, 7, 139-142.

The Human Salivary Reflex and its Use in Psychology. *Psychol. Rev.*, 1916, 23, 446-464.

Reflex Secretion of the Human Parotid Gland. *Jour. Exp. Psychol.*, 1916, 1, 461-493.

Changes in the Amount of Salivary Secretion Associated with Cerebral Lesions in Man. *Amer. Jour. Physiol.*, 1917, 43, 62-72.

The Accuracy of Movement in the Absence of Excitation from the Moving Organ. *Amer. Jour. Physiol.*, 1917, 43, 169-194.

Modifiability of the Preferential Use of the Hands in the Rhesus Monkey. *Jour. Animal Behav.*, 1917, 7.

Sensory Physiology of Animals. *Psychol. Bull.*, 1916, 13, 309-315.

Smith's "The Investigation of Mind in Animals." *Jour. Philos., Psychol., etc.*, 1916, 13, 614.

JOHN B. WATSON,

Director of the Psychological Laboratory.

ROMANCE LANGUAGES

1. Graduate Courses.

Professor Armstrong conducted courses in the history of the French language as follows: Pronunciation of French, *weekly*; History of Sounds and Inflections, *three hours weekly, second half-year*; Historical Syntax, *weekly*; Gallic Folk Latin, *three hours weekly, first half-year*. He also gave a weekly course of selected readings in Old French literature, and a weekly course in French and Provençal lyrics.

Professor Marden conducted courses in the Beginnings of Spanish Literature, *weekly*; and in Readings in Old Spanish, *weekly*.

Professor Brush conducted a weekly course in the Eighteenth Century French Drama and Novel.

Associate Professor Shaw conducted courses in the Interpretation of Selections from Leopardi, *weekly*; and in Dante's *Vita Nuova*, *weekly*.

Mr. Carcassonne conducted courses in French literature as follows: Boileau et son temps: Le Mouvement littéraire au début du XIX^e siècle; Les Questions sociales dans la littérature de 1830 à 1848 (*each weekly*); and Explications d'auteurs français (*two hours weekly*).

The staff and graduate students of the department assembled

weekly in the Romance Journal Club for reviews of recent scientific literature and the presentation of papers of departmental interest.

The Seminary in French Literature met two hours fortnightly, under the direction of Mr. Carcassonne, and was devoted to the study of the *Nouvelle Héloïse*. The members of the Seminary successively submitted to the discussion of the whole group the results of their personal investigation of the text and the editions, the psychological analysis of the characters, the moral and religious ideas developed in the novel and the language and style of Jean-Jacques Rousseau. An effort was made to determine the place of the *Nouvelle Héloïse* in eighteenth-century French literature, to locate the traces of exterior influence which prepared the way for the work, to specify the originality of the thoughts, the sentiments, and the art, and to judge the nature and the bearing of the influence that the book exercised upon the contemporary public.

The Seminary in Spanish met two hours weekly, under the direction of Professor Marden, and continued the study of the *Libro de Apolonio* which had occupied the Seminary during the previous year. During the present session, attention was directed to the syntax of the poem with special reference to the use of the prepositions. The results of each chapter of study were applied, for verification and comparison, to the other literary monuments of the early Spanish period.

In addition to the scheduled courses, the following lectures were given before the department:

Professor Gustave Lanson: "Les Origines françaises du romantisme français," "Ce qu'il y a de classique chez les romantiques," and a text interpretation from Rabelais; Professor F. M. Warren: "The Influence of Surroundings on French Character"; Professor F. de Onis: "Definición de la novela picaresca"; Professor E. D. Dargan: "French Classicism and the Modern Spirit," and "Montesquieu."

2. Collegiate Courses.

French Elements, three sections, *each four hours weekly*, Associate Professor Shaw and Mr. Hastings. French 1, three sections, *each four hours weekly*, Professor Brush, Dr. Gruenbaum and Mr. Hastings. French 2, *three hours weekly*, French 3-4, *three hours weekly*, and French 5, *weekly*, Professor Brush.

Spanish 1, Spanish 2, Spanish 3, *each three hours weekly*, Dr. Buceta.

Italian 1, *three hours weekly*, Associate Professor Shaw.

3. College Courses for Teachers.

French 1 (the Elements of French), *three hours weekly*, Professor Sheffoe. French 2 (Intermediate French), and French 3 (Advanced French), *each two hours weekly*, Dr. Gruenbaum. Spanish Elements, *two hours weekly*, Dr. Gruenbaum. Practical Spanish, *two hours weekly*, Dr. Buceta. The course in Italian 1, listed among Collegiate Courses, was likewise open to teachers.

EDWARD C. ARMSTRONG,
Professor of the French Language, Chairman.

SANSKRIT AND COMPARATIVE PHILOLOGY

During the session of 1916-17 advanced work in Hindu Philology was concerned with the Vedas and the Hindu Drama. The Vedic Seminary, in rotation between the various phases of the ancient literature, returned once more to the Atharva-Veda (see President's Report for 1904, Johns Hopkins Circulars, No. 173, p. 41). The position and character of this Veda was discussed on the basis of Bloomfield's *Prolegomena* (The Atharva-Veda and the Gopatha Brāhmaṇa; Strassburg, 1899). The reading of Atharvan hymns was arranged according to the various classes of prayers, charms and blessings contained therein. Especially, the extensive class of love charms (philtres) was studied exhaustively with some reference to the similar literatures among European peoples.

Professor Bloomfield delivered his opening address as President of the Johns Hopkins University Philological Association on 'Some Cruces in Vedic Text, Grammar and Interpretation.' This address is published in the *American Journal of Philology* (see below).

The Hindu drama, written regularly part in Sanskrit and part in various popular dialects (Prākṛit), was the theme in advanced work in classical literature. After some conferences dealing with the character and origin of the Hindu drama, the *Mṛchakatikā* ('Toy-Card'), the single masterpiece of King Cūdraka, was made the theme for the entire session.

The regular beginners' course in Classical Sanskrit, carried on two hours a week during the session, assembled the unusually large number of six students from the various philological schools of the University. This course is the formal introduction to the study of Hindu philology, as well as to the study of the Comparative Philology of the Indo-European languages.

The work in Comparative Philology was two-fold. First, a course of lectures on General Comparative Philology. This began with a definition of the theme and its relation to History, followed by a brief sketch of the development of this science. The bulk of the lectures dealt with the linguistic Ethnology of the Indo-European peoples, their divisions, special inter-relations, and their original home (the so-called 'Aryan Question'). This was followed by sketches of the individual peoples of the family: India, the Vedas, Brāhmanism, Sanskrit Literature, and Buddhism; Persia, the Achaemenidan cuneiform inscriptions, the Zoroastrian Literature (Avesta) and religion; the minor and problematic Indo-European peoples; and finally ethnological sketches of the European peoples, and their national religions.

A second course, in the Comparative Grammar of the Indo-European languages, treated the history of the vowels, and their 'ablaut' relations, with particular reference to Greek, Latin, Teutonic and Sanskrit. This was preceded by a series of conferences on the phonetics of the vowels. A corresponding course on the history of the consonants is offered during the session of 1917-18.

Professor Bloomfield has published: *Rig-Veda Repetitions*; the repeated verses and disticha and stanzas of the Rig-Veda in systematic presentation and with critical discussion. Part I: The repeated passages of the Rig-Veda, systematically presented in the order of the Rig-Veda, with critical comments and notes. Part II: Explanatory and analytic. Comments and classifications from metrical and lexical and grammatical and other points of view. *Harvard Oriental Series*, volumes xx and xxiv. Cambridge, 1916.

Some Cruces in Vedic Text, Grammar, and Interpretation, *American Journal of Philology*, volume xxxviii, pp. 1-18.

On the Art of Entering Another's Body: A Hindu Fiction Motif. *Proceedings of the American Philosophical Society*, volume lvi, pp. 1-43.

On more than one occasion—last time in the President's Annual Report for 1914-15—I have presented to the authorities of the University a plea for assistance in my work, in the shape of an Adjunct Professor of Comparative Philology. By the irony of fate the most obviously duplex school of the University, the school of 'Sanskrit and Comparative Philology,' has been carried on continuously for thirty-six years by a single stable teacher. In the report cited a mere statement of what is now meant by these twin subjects shows that they cover in some sense half the earth. Indological literature, which includes the study of Buddhism all over Asia with its Tibetan and Chinese affiliations, is to be compared in extent and importance with the combined literature of Europe; the languages concerned in this study are scarcely less manifold. A superficial glance at the interests of Comparative Philology shows that this subject involves, in some sense and measure, Iranian, Celtic, and Slavic Philology. The same general theme of Comparative Philology, I need hardly mention, includes also Physiology of Sound (Phonetics) and Linguistic Science. All these studies keep on expanding, and at the same time deepening. Without these interests a university scarcely justifies its name; it is equally obvious that without permanent assistance these subjects can no longer be treated by a single teacher. However eager he may be to grasp firmly and develop properly the themes he chooses out of this mass, he finds himself checked by considerations of time and working power. I may say that Harvard, Yale, Pennsylvania, and Chicago each have two or more teachers in these subjects. I am convinced that any free funds which may be at the disposal of the University in the immediate future can be applied to no better purpose than to strengthen by a permanent appointment these studies which have been carried on here from the beginning continuously, and, as I believe, with profit and credit to the University as a whole.

MAURICE BLOOMFIELD,

Professor of Sanskrit and Comparative Philology.

ZOOLOGY, BOTANY, PLANT PHYSIOLOGY

I. ZOOLOGY

INVESTIGATIONS

The following lines of investigation have been in progress during the past year:

(1) Under the direction of Professor Jennings, researches on genetics, particularly in the lower organisms. Mr. F. M. Root, Bruce Fellow, concluded and prepared for publication his work on Heredity and the Effects of Selection in *Centropyxis aculeata*. Professor Jennings examined the mechanism of heredity and of development in certain favorable characters of *Diffugia*. He also prepared a second mathematical paper on the result of different methods of breeding, with reference to two linked characters. Miss Inez Coldwell undertook a study of certain problems of genetics in Protozoa.

(2) Under the direction of Professor Mast, investigations on the physiology and behavior of lower organisms. Professor Mast himself carried on work on conjugation, encystment, variation and the factors determining the length of life of the race, in the infusorian *Didinium*. He continued also the work on the reactions of organisms to light; and began an investigation of the effects of alcohol on the germ cells of the fish *Gambusia*. Mr. W. H. Taliaferro worked on the reactions of a flatworm to light. Miss Mary Gover finished her study of the relation between light and activity in certain infusoria.

(3) Under the direction of Professor Grave, Mr. H. S. Hopkins has investigated the green algae symbiotic in certain Mollusca.

(4) Professor H. F. Perkins, of the University of Vermont, who has been at work in the laboratory during a year's leave of absence, has investigated the problem of rhythmic activities in certain lower animals.

LECTURES AND CLASS ROOM WORK

Biological Journal Club:—The instructors and graduate students in Zoology joined with those in Botany and Plant Physiology in a weekly club for the presentation and discussion of recent investigations in these fields.

Zoological Seminary:—The Seminary met weekly in the evening, devoting itself to a reading and discussion of Radl's *Geschichte der Biologischen Theorien*. It included, in addition to the instructors and graduate students in Zoology, certain members of the staff of the department of Zoology of Goucher College.

The following courses were conducted by the different members of the staff:

Professor Jennings:

Heredity, Variation and Evolution. *Three lectures weekly, from October 1 to February 1; once a week for the remainder of the year.*

Investigations in Experimental Zoology. *Daily, throughout the year.*

Professor Andrews:

1. General Biology. *Nine hours weekly, October 1 to March 15.*
2. Embryology. *Nine hours weekly, from March 15 to the end of the year.*
3. Zoology of Non-vertebrates. *Nine hours weekly, October to June.*

Associate Professor Grave:

Comparative Anatomy of Vertebrates, Cytology and Embryology.
Nine hours weekly throughout the year.
Investigations. *Hours as required.*

Associate Professor Mast:

General Physiology and Animal Behavior. *Three lectures or conferences and two laboratory periods weekly, throughout the year.*
Investigations in Animal Behavior. *Hours as required.*

MISCELLANEOUS

Effect of Removal to Homewood:—The new location of the laboratory, on the grounds at Homewood, has been of great advantage to all the zoological work, enabling us to keep in closer contact with living organisms in their natural environment and greatly facilitating experimental work. Naturally, in some matters of detail the temporary quarters are unsuited for the work; still further advantages will be realized when a biological laboratory is available. Our most immediate need is a small house for cultures and the keeping of living animals.

In the undergraduate instruction, the class in elementary biology has this year for the first time been able to collect amoeba and other organisms from the ponds preserved for that purpose and from cement tanks in the grounds adjacent to the laboratory, and thus a much greater interest and more adequate conception of organisms and environment was aroused in the students, as compared with the former years when the great distance and inaccessibility of the living materials used in class work necessitated the deputing of all the direct contact with environmental nature to the instructor, to the loss of the student.

It is much to be hoped that in the future this advantage of Homewood may be enhanced by the installation of added aquaria and pools and by the employment of suitable aid in the maintenance of the culture tanks and their protection from such thoughtless interference as naturally has resulted from the exposed location, and the years of comparative neglect which the grounds suffered before actual occupation.

On the other hand the new room assigned to the use of all the undergraduate instruction in Biology has proved inferior to the rooms occupied during some thirty years in the old biological

laboratory, since the present quarters are less in area, much less in space, and present far too inadequate window glass area; besides not having the former specialization for the purpose in hand and not having the separation of work and lecture room so desirable when three courses are to be conducted in the same area. The necessary crowding greatly hampered instruction despite the very patient submission of the students to the annoyances of mutual interferences and despite the ingenious efficiency devices of the assistant. One of the first improvements in the conditions for better work in college Biology will be the allotment of more space and window light.

It should also be emphasized that the biological work of the summer school added much to its effectiveness by being able to move out to Homewood even in the season of 1916, since the pools, tanks, museum and the botanic garden were thus for the first time available for the work of the summer school.

The courses in Biology in the summer school of 1916 were conducted by H. E. Enders (Ph. D., Johns Hopkins University), of Purdue University.

The student assistants in Zoology for the year were W. H. Taliaferro, H. S. Hopkins and Inez Coldwell.

The requirements for the doctor's degree were absolved by F. M. Root.

Professor Grave continues his work during the summer in charge of the course in Invertebrate Zoology at the Marine Biological Laboratory at Wood's Hole, Mass.

Professor Jennings gave four lectures on the Westbrook Foundation of the Wagner Free Institute of Science, of Philadelphia, on *Life, Death and Reproduction; Heredity and Evolution in the Simplest Organisms*. He also lectured for the Educational Committee of the City Club of Chicago, on *The Biology of Children in Relation to Education*; and before the Washington Academy of Science on *Observed Changes in Hereditary Characters in Relation to Evolution*.

PUBLICATIONS IN ZOOLOGY

The following list includes the publications that have appeared between July 1, 1916, and July 1, 1917:—

Churchill, E. P.

The Absorption of Nutriment from Solution by Fresh-water Mussels. *Journal of Experimental Zoology*, Vol. 21 (1916), pp. 403-429.

Jennings, H. S.

Heredity, Variation and the Results of Selection in the Uniparental Reproduction of *Diffugia corona*. *Genetics*, Vol. 1 (1916), pp. 407-534.

The Numerical Results of Diverse Systems of Breeding, with Respect to Two Pairs of Characters, Linked or Independent, with Special Relation to the Effects of Linkage. *Genetics*, Vol. 2 (1917), pp. 97-154.

Modifying Factors and Multiple Allelomorphs in Relation to the Results of Selection. *American Naturalist*, Vol. 51 (1917), pp. 301-306.

Observed Changes in Hereditary Characters in Relation to Evolution. *Journal of the Washington Academy of Sciences*, Vol. 7 (1917), pp. 281-301.

Mast, S. O.

The Relation between Spectral Colors and Stimulation in the Lower Organisms. *Journal of Experimental Zoology*, Vol. 22 (1917), pp. 471-528.

Mutation in *Didinium Nasutum*. *Anatomical Record*, Vol. 2 (1917), pp. 501-502.

The Vitality of Cysts of *Didinium Nasutum*. *Anatomical Record*, Vol. 2 (1917), p. 534.

The Significance of Conjugation in *Didinium Nasutum*. *Anatomical Record*, Vol. 2 (1917), pp. 525-536.

Mast, S. O. and Lashley, K. S.

Observations on ciliary currents in free-swimming *Paramecia*. *Journal of Experimental Zoology*, Vol. 21 (1916), pp. 281-293.

Mast, S. O. and Root, F. M.

Observations on *Amoeba* feeding on infusoria and their bearing on the surface-tension theory. *Journal of Experimental Zoology*, Vol. 21 (1916), pp. 33-46.

Taliaferro, W. H.

Literature for 1915 on the behavior of the lower invertebrates. *Journal of Animal Behavior*, Vol. 6 (1916), pp. 375-382.

Orientation to light in *Planaria* (n. sp.) and the function of the eyes. *Anatomical Record*, Vol. 2 (1917), pp. 524-526.

II. BOTANY

Lectures and laboratory work have been conducted as follows:

Professor Johnson:

The Physiological Anatomy of Plants. Laboratory work, conferences and demonstrations. *Six hours a week, from February to June.*

Reproduction and Phylogeny in Plants. Conferences and laboratory work. *Nine hours a week, February 1 to June. Five field trips on Saturdays.*

The Structure of Root, Stem and Leaf. *Laboratory work, lectures and conferences. Six hours a week, from October 1 to February 1. Field trips on Saturdays.*

Botanical Seminary. (The Classification, Geographical Distribution and Economic Importance of the Monocotyledons.) *One hour a week, November to June.*

Laboratory Instruction and Research. *Daily, October to June.*

JOURNAL CLUB

The botanists meet in conjunction with the zoologists and plant physiologists for the discussion of current literature.

ADVANCED WORK

Professor Johnson during July, August and September, 1916, continued his study of the development and proliferation of the fruits of the cacti of Arizona, in the Harpawell Laboratory. The results of these studies are now ready for publication. Much time has been devoted by him to arranging for the co-operation of fifteen American botanical institutions in leasing the Cinchona Tropical Botanical Station for the use of American botanists. This laboratory is now under the control of a committee, consisting of D. S. Johnson, N. L. Britton and J. M. Coulter.

Doctor Grace A. Dunn (Ph.D., 1915), Fellow by Courtesy and Alice Freeman Palmer Fellow of Wellesley College for 1916-17, has initiated here a research on the experimental morphology of reproduction in the bread mould *Rhizopus nigricans*. Her work has already led to important results largely of a physiological nature.

W. E. Seifriz, Student Assistant in Botany, has initiated a study of the structure of protoplasm by the aid of microdissection.

BOTANICAL GARDEN

Seeds and plants needed for the Garden and in the laboratories have been received from the garden of Lady Hanbury at Mortola, Italy, from the United States Department of Agriculture, the National Museum, and the Missouri Botanical Garden. A number of interesting living plants, native to the northeastern United States, were secured by Professor Johnson while in that region last summer.

The outdoor labels for showing the distribution of native trees have proven very successful. A series of similar labels indicating the geographical distribution of plants not native to North America is now being installed.

Considerable additions have been made during the year to the nursery of valuable shrubs and trees to be used about the grounds at Homewood as the location and construction of buildings is completed. Quite a number of these plants have already been used about Gilman Hall.

The usefulness of the Botanical Garden to members of the University has been greatly increased by the moving of the University to Homewood. The interest the Garden has for other Baltimoreans is evidenced by an ever-growing number of visitors, especially of students of the schools and colleges of the city.

PUBLICATIONS IN BOTANY

D. S. Johnson.

Two New College Texts. (A review.) *Botanical Gazette*, Vol. 63, p. 324, 1917.

The Cinchona Tropical Station and its Advantages for American Botanists. *Science*. Vol. 45, p. 209, and *Botanical Gazette*, Vol. 63, p. 412, 1917.

Grace A. Dunn.

The Development of *Dumontia filiformis*. II. Antheridia and carpogonia. *Botanical Gazette*, Vol. 63, pp. 425-467, 1917.

Needs of the Botanical Department.—Courses in bacteriology and plant pathology and the desirability of an adequate biological building at Homewood, pointed out in earlier reports, are still our most important needs.

III. PLANT PHYSIOLOGY

ACADEMIC WORK

The general course for orientation in this subject (Course I of the *University Register*) was conducted in regular form with an attendance of seven for the lectures and five for the laboratory work. The lectures were given mainly by Professor Livingston and the laboratory work was in charge of Doctor Pulling, who also gave the lectures on photosynthesis. The course on the application of plant physiology to other lines of study (Course III of the *University Register*) was not offered this year, but much of its subject-material was included in the conferences of the course on special problems (Course II of the *University Register*), which was again conducted as an irregular series of informal personal conferences on the early stages of experimental investigations actually being taken up. It was conducted by Professor Livingston and Doctor Pulling. The course on planning, interpretation and presentation of experimental studies (Course IV of the *University Register*) was offered this year for the first time by Professor Livingston, with an attendance of seven. It developed into a series of informal discussions on usually neglected details of logical thinking and analysis and of clear writing, as applied to physiological research.

During the year five students completed the University requirements for the doctor's degree with plant physiology as principal subject, and the degree was conferred upon them in June. Two students completed the requirements for a subordinate in plant physiology. From the establishment of this department, in October, 1909, to June, 1917, the Ph. D., degree has been conferred on nine students with plant physiology as principal subject—an average of about one per year. During the same period fifteen students have completed work in this subject as a subordinate. No undergraduate work has been conducted and no master's degrees have yet been conferred in plant physiology. Of those who have received the doctor's degree with plant physiology as principal subject, one is now

employed in the Bureau of Plant Industry of the U. S. Department of Agriculture, four are employed in state agricultural experiment stations, two are on the staff of the School of Agriculture of the University of the Philippines, and two hold commissions in the U. S. Army.

RESEARCH AND RELATED ACTIVITIES

The main effort of the Laboratory of Plant Physiology has continued to be directed toward advancing this science through the accomplishment and publication of original research, and special attention has been given to fundamental physiological problems that give promise of furthering progress in the arts of forestry and agriculture as well as in physiological science as such. Practical problems are not allowed to influence these activities, however, excepting as they furnish suggestions for the choosing of scientific problems upon which serious work may be undertaken. This emphasis upon the basic role to be played by the science of plant physiology in the future progress of the art of plant production is becoming generally recognized, especially with the present world-wide emphasis upon the importance of a scientifically efficient agriculture and forestry to human welfare in general.

A considerable portion of the researches hitherto carried out in this laboratory were suggested by studies originally begun in the arid Southwest, where the influence of the environmental moisture conditions upon plant growth and development is peculiarly patent. It is generally true that the nature of the physiological influence exerted upon an organism by any particular kind of external condition may be much more readily appreciated if the organisms observed are subjected to somewhat pronounced extremes of the condition in question. This is why plant water relations are more generally apparent in an arid than in a humid region. As work has progressed toward a more satisfactory appreciation of the water relations of plants it has become apparent that temperature and light relations require to be studied from the same general point of view, and some attention has already been given to these environmental features. It seemed desirable to supplement the viewpoint of our studies on the conditional control of plant processes by a personal acquaintance with the more superficial aspects of plant growth in a region where temperature rather than moisture is the condition of greatest influence. To accomplish this, and also to gain a superficial familiarity with some aspects of plant behavior when the diurnal period of sunlight is exceptionally prolonged, Professor Livingston and Doctor Pulling spent the latter half of the summer of 1916 in making a preliminary ecological survey of the middle portion of the Nelson river valley, northern Manitoba, in latitude 54° to 56° north. While little quantitative information could be obtained on a canoe trip of this kind, numerous enlightening suggestions were derived from their observations.

On this excursion Professor Livingston and Doctor Pulling made some preliminary observations on light conditions, employing a simple radiation thermometer and photo-sensitive paper. At the same time Professor Livingston collected data for a preliminary study of the rate of tree growth as influenced by climatic conditions

in general and as a criterion for the comparison of different climatic complexes. Doctor Pulling also carried out a study of soil conditions as related to root distribution in this northern region, where such work had not previously been undertaken.

In Baltimore, Professor Livingston has devoted much of the academic year here considered to the perfecting of plans for the artificial control of temperature and moisture conditions for physiological experimentation. With the assistance of Mr. H. S. Fawcett (Associate Professor of Plant Pathology in the Citrus Experiment Station of the University of California, on leave of absence; Johnston Scholar in this University for the year 1916-1917), a large differential thermostat has been planned, constructed and installed. Professor Livingston has also completed plans for three large, glass culture chambers, for the artificial control of temperature and air humidity. These will be employed in experimental studies on the influence of these environmental conditions upon plants growing with natural light fluctuations. With the assistance of Mr. W. E. Tottingham (Assistant Professor of Agricultural Chemistry, University of Wisconsin, on leave of absence for the year 1916-17), these chambers have been erected and a portion of the controls have been installed.

Professor Livingston has also given considerable attention to the further perfecting of the porous-cup atmometer and the radio-atmometer, both of which instruments have been mentioned in earlier reports. He also carried out, with the assistance of Mr. E. S. Johnston, a first study on incipient drying and temporary and permanent wilting in plants with their roots in water and air shoots in the rather humid conditions of the experiment greenhouse.

Professor Livingston served as chairman of the Committee on Climatic Conditions, of the Ecological Society of America, a committee for the formulating of plans and the making of recommendations regarding research on the climatic relations of animals and plants. He has continued as managing editor of *Physiological Researches*, and has completed the editorial work on an annotated English translation of Palladin's *Plant Physiology*, based largely on the German translation of the sixth Russian edition, but including the changes made in the seventh Russian edition. This manuscript is now in the hands of the publishers.

Doctor Pulling has continued his studies on the capillary movement of soil moisture as related to water absorption by plants.

Mr. Fawcett made a preliminary study of the relation of temperature to the growth of certain parasitic fungi in culture media, especially with reference to citrus diseases in Florida and California. This work will be continued.

Doctor Donald Reddick, Professor of Plant Pathology in Cornell University (on leave of absence for this year, during which he has been Fellow by Courtesy in the Johns Hopkins University), conducted preliminary studies on the relation of the physiological tone of the host plant to its susceptibility to infection by fungus parasites. Three different methods were employed to obtain bean-plants of different degrees of tone or vigor; (1) causing the plants to absorb

their water supply against different amounts of resistance in the soil; (2) subjecting the plants to widely different soil temperatures while the air temperature was practically the same in all cases; and (3) causing the plants to absorb their nutrient salts from nutrient solutions all of which had the same lowering of the freezing-point but each of which differed from the others in the proportions of nutrient salts.

Mr. E. E. Free continued, and brought to a satisfactory temporary termination, his experimental study of the relation of the free oxygen content of the soil to the health of ordinary rooted plants. Mr. Free received the degree of Ph.D. in June and immediately took charge of the research department of the National Sulphur Company. He afterwards received a commission in the U. S. Army.

Mr. F. M. Hildebrandt continued the interpretation of data obtained by Dr. McLean (now of the College of Agriculture of the University of the Philippines) in the summer of 1914, on the relation of climatic conditions to plant growth at a number of widely distributed stations in Maryland. This work has been carried on partly under the auspices of the Maryland State Weather Service, and the results form a second contribution on this subject. Mr. Hildebrandt received the Ph.D., degree in June and was engaged in plant physiological research in the Bureau of Plant Industry of the U. S. Department of Agriculture until he received a commission in the U. S. Army.

Mr. E. S. Johnston made an experimental study of the seasonal variations throughout the year in the climatic conditions of one of the experimental greenhouses, as these variations are related to plant growth. Mr. Johnston received the Ph.D. degree in June and is now engaged in research in agricultural climatology at the Maryland Agricultural Experiment Station.

Mr. W. E. Tottingham, Assistant Professor of Physiological Chemistry in the University of Wisconsin and the Wisconsin Agricultural Experiment Station, on leave of absence this year, prepared his dissertation on the relation of chlorides to the growth of certain agricultural plants (especially the sugar-beet and potato), the experimentation therefor having been accomplished mainly at the University of Wisconsin. He also continued his studies on plant nutrition in water-cultures. It will be recalled that he spent the year 1912-13 in this laboratory, making a very thorough study of liquid media for plant growth, a report of which has been published. Mr. Tottingham received the Ph.D. degree in June and has returned to his position in the University of Wisconsin.

Mr. S. F. Trelease made an experimental study of the relation between the growth of wheat and the total concentration and salt proportions of a water-culture medium containing all the necessary chemical elements and also chlorine, as potassium chloride. Mr. Trelease received the Ph.D., degree in June and is now Associate Professor of Botany in the University of the Philippines.

Mr. F. S. Holmes has made a preliminary study of the possibility of artificially causing a continuous movement of water (or nutrient

solution) through a mass of soil, while the moisture content of the soil is maintained comparatively low.

THE LABORATORY OF PLANT PHYSIOLOGY

During the year in question the apparatus and materials belonging to the laboratory have been thoroughly catalogued by Doctor Pulling, so that it may now be readily determined just what is in stock, where it is, or to whom it has been assigned. Considering the continually increasing number of items in our list of apparatus and supplies, together with the crowded condition of the stock-room, this card index is proving to be a very great help toward the avoidance of waste and duplication in equipment and toward general efficiency. Professor Livingston has been assisted in various ways during the year by Mr. Fawcett, Mr. Johnston, Mr. Free and Miss W. Brenton.

As in previous years, an attempt has been made to utilize the somewhat expensive equipment of this laboratory throughout the entire year, so that the investment has not been allowed to be totally unproductive during the summer months. Professor Livingston and Doctor Pulling continued their work into the summer of 1916, until August 15, when they left for the far north. Mr. Free's experiments were continued until August 1, and Mr. Johnston's series of cultures for the study of naturally varying climatic conditions extended without break from February, 1916, to March, 1917.

Aside from a number of smaller pieces of apparatus and the supplies of various materials required by the researches that have been in progress, two larger and permanent improvements in the equipment of the Laboratory of Plant Physiology have been wholly or partially installed during this year. As has been mentioned, a large differential thermostat has been devised and constructed. This is located in one of the greenhouse rooms, and has the external form of a rectangular box, 25 inches high, 24 inches wide and 14 feet long. It consists essentially of a galvanized iron tank with cross partitions dividing it into ten compartments, the whole furnished with hair insulation. A large compartment at one end contains water and ice. Next to this is a narrow buffer compartment of water with mechanical stirrers, which may be heated when necessary. Then follow seven compartments, each of which contains a water-jacketed chamber opening at the top, the water-jacket being provided with stirrers in each case. The series ends with a small compartment of water with electric heating control and also mechanical stirrers. One end is kept at a low temperature and the other at a high temperature, and a permanent temperature gradient is maintained throughout the series of culture chambers. This apparatus is being used in the experimental study of the influence of temperature upon organisms in the absence of light and has proved very satisfactory.

A beginning has been made in the construction of lighted chambers with automatic control of temperature and air humidity, but these are not yet in operation. They are three in number and are placed in one of the greenhouse rooms. Each consists of a cubical, double-walled, glazed chamber, four feet on a side, provided with rotating

table for cultures. The chambers themselves are finished but the controls are not yet complete. They are planned for the experimental study of temperature and air humidity conditions as these influence the growth of plants that are subjected to the natural fluctuations of light and darkness.

Of the future needs of this department mentioned in the report for 1914-15, that of somewhat increased laboratory space is most pressing. During 1916-17 the rooms have not properly sufficed for the work in hand, so that actual inconvenience and hindrance have frequently resulted, although these have been circumvented by special arrangements, such as the employment of the hall on the second floor as a work-room. The completion of the range of buildings at the south side of the Batonical Garden, as originally planned, ought to be achieved as soon as may be.

The importance of plant physiology as the science underlying agriculture, together with the increasing general appreciation of the need for scientific efficiency in agricultural work, emphasizes another opportunity for increased facilities which has not previously been mentioned. As the investigation of the conditions that control plant growth progress it becomes more and more obvious that an experiment plot of ground in the open would greatly facilitate the extension of our experimentation through field or garden tests, which may aid greatly in the application of our scientific findings to the industries of plant production.

PUBLICATIONS IN PLANT PHYSIOLOGY

Cannon, W. A., and E. E. Free.

The ecological significance of soil aeration. *Science N. S.* 45: 178-180. 1917.

Free, E. E.

An ancient lake basin on the Mohave river. *Carnegie Inst. Wash. Year Book* 15: 90-91. 1917.

Underground structure and artesian water in desert valleys of the Great Basin. *Carnegie Inst. Year Book* 15: 91-94. 1917.

Livingston, B. E.

A quarter-century of growth in plant physiology. *Plant World* 20: 1-15. 1917.

The laboratory of plant physiology. *Johns Hopkins Univ. Circ.*, whole number 290: 40-45. 1916.

The department of plant physiology. *Ibid.*, whole number 293: 133-154. 1917.

List of publications from the laboratory of plant physiology. *Ibid.*, 293: 154-159. 1917.

Atmometric units. *Ibid.*, 293: 160-170. 1917.

The vapor tension deficit as an index of the moisture conditions of the air. *Ibid.*, 293: 170-175. 1917.

Incipient drying and temporary and permanent wilting of plants,

as related to external and internal conditions. *Ibid.*, 293: 176-182. 1917.

Livingston, B. E., and E. E. Free.

Relation of soil aeration to plant growth. *Carnegie Inst. Wash. Year Book* 15: 78. 1917.

The effect of deficient soil oxygen on the roots of higher plants. *Johns Hopkins Univ. Circ.*, whole number 293: 182-185. 1917.

Livingston, B. E., and F. T. McLean.

A living climatological instrument. *Science N. S.* 43: 362-363. 1916.

Livingston, B. E., and Edith B. Shreve.

Improvements in the method for determining the transpiring power of plant surfaces by hygrometric paper. *Plant World* 19: 287-309. 1916.

Livingston, B. E., and F. Shreve.

The role of climatic factors in determining the distribution of vegetation in the United States. *Carnegie Inst. Wash. Year Book* 15: 69-72. 1917.

Pulling, H. E.

The angular micrometer and its use in delicate and accurate microscopic measurements. *Amer. Jour. Bot.* 8: 393-406. 1916.

The experimental determination of a dynamic soil-moisture minimum. *Johns Hopkins Univ. Circ.*, whole number 293: 186-188. 1917.

Some unusual features of a subarctic soil. *Ibid.*, 293: 188-190. 1917.

Fawcett, H. S.

The geographical distribution of the citrus diseases, melanose and stem-end rot. *Ibid.*, 293: 190-193. 1917.

Preliminary note on the relation of temperature to the growth of certain parasitic fungi in cultures. *Ibid.*, 293: 193-194. 1917.

Free, E. E.

Symptoms of poisoning by certain elements in *Pelargonium* and other plants. *Ibid.*, 293: 195-198. 1917.

The effect of aeration on the growth of buckwheat in water-cultures. *Ibid.*, 293: 198-199. 1917.

Free, E. E., and S. F. Trelease.

The effects of certain mineral poisons on young wheat plants in three-salt nutrient solutions. *Ibid.*, 293: 199-201. 1917.

Hildebrandt, F. M.

Leaf-production as an index of growth in soy-bean. *Ibid.*, 293: 202-205. 1917.

A method for approximating sunshine intensity from ocular observations of cloudiness. *Ibid.*, 293: 205-208. 1917.

Holmes, F. S.

Moisture equilibrium in pots of soil equipped with auto-irrigators. *Ibid.*, 293: 208-210. 1917.

Johnston, E. S.

Seasonal variations in the growth-rates of buckwheat plants under greenhouse conditions. *Ibid.*, 293: 211-217. 1917.

McLean, F. T.

A preliminary study of climatic conditions in Maryland, as related to plant growth. *Physiol. Res.* 2: 129-208. 1917.

Tottingham, W. E.

On the relation of chlorine to plant growth. *Johns Hopkins Univ. Circ.*, whole number 293: 217-221. 1917.

Trelease, S. F.

A study of salt proportions in a nutrient solution containing chloride, as related to the growth of young wheat plants. *Ibid.*, 293: 222-225. 1917.

The relation of the concentration of the nutrient solution to the growth of young wheat plants in water-cultures. *Ibid.*, 293: 225-227. 1917.

Trelease, S. F., and E. E. Free.

The effect of renewal of culture solutions on the growth of young wheat plants in water-cultures. *Ibid.*, 293: 227-228. 1917.

HERBERT S. JENNINGS,

Director of the Zoological Laboratory.

DUNCAN S. JOHNSON,

Director of the Botanical Laboratory.

BURTON E. LIVINGSTON,

*Director of the Laboratory of
Plant Physiology.*

REPORT OF THE DEAN OF THE COLLEGE FACULTY, 1916-17

TO THE PRESIDENT OF THE UNIVERSITY:

The year opened in the new quarters at Homewood with an overwhelming inrush of new students, but it was found possible to make the necessary provision for additional classes without serious difficulty. The courses offered were those listed in the reports of the several departments and did not materially differ from those of previous years.

The Gymnasium Department, however, underwent exceptional expansion by the introduction of a new course in Military Training. With the approval of the Board of Trustees, there was organized at the University a unit of the Senior Division of the Reserve Officers' Training Corps under the direction of an officer detailed by the United States Government, assisted by two non-commissioned officers similarly detailed.

As arranged, the course calls for two drills and one lecture weekly, with supplementary tactical exercises from time to time. It is optional, but when once elected must be followed for two years, as a prerequisite for graduation. Though the course was offered primarily for first and second year students, as an alternative for physical exercise, many upper classmen also enlisted, and a battalion of over one hundred and fifty was formed. After the declaration of war in April, a new impetus was given to the work, and many additional students were enrolled for a period of intensive training. The arms were furnished by the Government.

A supplementary course of five hours a week for two years will be organized as an elective for those students who have had the first two years' work.

When the call for service came, the undergraduate body was not slow to respond, as will be seen by the list below. Many others felt that they could be of service to the country in other lines and withdrew during the last term to lend a helping hand to the farmers.

To all these men provisional marks were given, and they may receive full credit for the term's work if they pass their future courses after their return to college.

Classes were kept up to the end of the term, despite so many withdrawals, but the Board of Collegiate Studies voted to substitute class-room tests for the usual three-hour final examinations.

At the request of the student body, the Board also voted to begin classes at eight-thirty instead of nine o'clock. This was done from the Easter recess on and was found to be satisfactory enough to continue into the coming year.

MURRAY P. BRUSH,
Dean of the College Faculty.

UNDERGRADUATES (1916-17) IN THE SERVICE

NAME	DEPARTMENT	SERVICE
S. E. Abrams.	Engineering.	Naval Reserve (furlough).
T. W. Allep.	College.	Naval Militia.
W. C. Alvey.	Engineering.	Naval Reserves.
H. S. Baker.	Engineering (B.S., 1917).	1st Lt., Engineers, U. S. R.
W. B. Baxley.	Engineering (B.S., 1917).	2nd Lt., Engineers, U. S. R.
J. O. Benson.	Engineering.	Naval Militia.
C. D. F. Brune.	College.	Field Artillery, U. S. R.
F. R. Calkins.	College.	Reserve Officers Tr. Corps.
M. B. Carroll.	College.	Aviation Corps.
A. K. Chalmers.	College.	Y. M. C. A. (Camp Meade & France).
C. W. Chesley.	Engineering (B.S., 1917).	1st Lt., Engineers, U. S. R.
S. I. Clark.	College.	1st Sergt., Ambulance Corps.
W. L. Clark.	College.	Ambulance Corps (France).
L. B. Connolly.	College.	Field Artillery, U. S. R.
B. H. Conn.	College (A. B., 1917).	Ambulance Corps.
Hugh Cort.	College.	Field Artillery, U. S. R.
R. A. Cox.	College.	Naval Militia (furlough).
W. F. Cromwell.	College.	Field Artillery, U. S. R.
M. J. Cromwell.	College.	Field Artillery, U. S. R.
J. S. Dempster.	Engineering.	Naval Militia.
R. N. Dempster.	Engineering.	Naval Militia.
R. R. Duncan.	College.	2nd Lt., Field Artill., U. S. R.
J. W. Darley.	Engineering (B.S., 1917).	1st Lt., Engineers, U. S. R.
A. C. Davis.	College (A. B., 1917).	Naval Militia.
F. W. Dawson.	College (A. B., 1917).	Ambulance Corps.
S. W. Egerton.	College.	Field Artillery, U. S. R.
E. E. Evans.	Engineering.	Naval Reserves.
H. C. Evans.	College.	Ambulance Corps (France).
R. W. Evitt.	Engineering (B.S., 1917).	2nd Lt., Aviation Corps.
M. C. Fenton.	College.	Field Artillery, U. S. R.
Robert France.	College (A. B., 1917).	Quartermaster's Corps, A. E. F.
H. F. W. Frank.	College (A. B., 1917).	1st Sergt., Ambulance Corps.
W. J. Fulton.	College.	Medical Corps, Camp Meade.
G. G. Gatchell.	College.	Field Artillery, U. S. R.
H. J. Gorman.	College (A. B., 1917).	1st Lt., U. S. Artillery.
W. G. Gressitt.	Engineering.	Naval Militia (furlough).
E. G. Hall.	Engineering (B.S., 1917).	2nd Lt., Engineers, U. S. R.
G. M. Hampson.	Engineering.	Naval Militia.
W. C. Harden.	College.	Naval Reserves.
R. G. Hoffman.	College.	Aviation Corps.
R. B. Holmes.	Engineering.	117th Trench Mort. Bat. (Fr.).
A. W. Jacobsen.	College.	Field Artillery, U. S. R.
L. E. Johnston.	Engineering.	Aviation Corps.
L. B. Kellum.	Engineering.	Reserve Officers Tr. Corps.
H. F. Knipp.	Engineering.	Naval Reserves.
M. B. Kohn.	College.	Field Artillery, U. S. R.
O. H. Lambert.	College.	Ambulance Corps.

C. C. Marbury.	College.	Field Artillery, U. S. R.
Malcolm Marty.	College.	Naval Reserves (furlough).
R. E. Martz.	Engineering.	Aviation Corps (England).
A. S. McCabe.	Engineering.	2nd Lt., U. S. Field Artillery.
W. A. McKewen.	College.	Ambulance Corps.
Otto Melamet.	Engineering.	1st Lt., Aviation Corps.
R. G. Merrick.	College (A. B., 1917).	1st Lt., U. S. A.
Ferdinand Meyer.	College.	Naval Militia.
J. M. Mowbray.	Engineering (B.S., 1917).	National Army.
G. S. Newcomer.	College.	Clerk, Government Service.
T. G. Parkman.	College.	Clerk, Dept of State.
Abraham Pikoos.	Engineering.	Field Signal Corps.
C. G. Pitt.	College.	Field Artillery, U. S. R.
Alexander Randall.	College.	Field Artillery, U. S. R.
W. A. Reaney.	College.	Field Artillery, U. S. R.
J. D. Roop.	College & Engineering (A. B. & B. S., 1917)	National Army.
J. G. Rouse.	College.	U. S. Infantry.
D. H. Rowland.	Engineering.	Field Artillery, U. S. R.
H. A. Rowland.	Engineering.	Field Artillery, U. S. R.
E. O. Shaw.	College (A. B., 1917).	Ambulance Corps.
G. B. Shawn.	Engineering.	U. S. Infantry.
W. H. Skinner.	College (A. B., 1917).	2nd Lt., U. S. A.
F. R. Smith, Jr.	College.	Field Artillery, U. S. R.
W. A. Strauss.	College.	Ambulance Corps.
W. H. Stokes.	College.	Field Artillery, U. S. R.
W. T. Ström.	College.	Field Artillery, U. S. R.
B. A. Sullivan.	Engineering.	Naval Reserves.
E. G. Stapleton.	Engineering.	National Army.
F. W. Sutton.	College.	Y. M. C. A. (Camp Meade).
W. H. Swartz.	College.	Reserve Officers Tr. Corps.
E. LeRoy Smith.	Engineering (B.S., 1917).	Engineers, U. S. R.
E. L. R. Smith.	College (A. B., 1917).	Field Artillery, U. S. R.
Randolph Smith.	College (A. B., 1917).	U. S. Navy (Radio Service).
P. B. Strobel.	Engineering (B.S., 1917).	Coast Artillery.
E. M. Stuart.	Engineering (B.S., 1917).	2nd Lt., Engineers, U. S. R.
W. L. Taylor, Jr.	College.	Naval Militia.
J. T. Thompson.	Engineering (B.S., 1917).	1st Lt., Engineers, U. S. R.
H. C. Thurman.	College.	Ambulance Corps.
G. D. Turner.	College.	Field Artillery, U. S. R.
J. M. C. Van Hulsteyn.	Engineering.	Aviation Corps.
W. H. Walker.	Engineering.	Naval Reserves.
E. L. Warner.	College.	U. S. Infantry.
Emanuel Wasserman.	Engineering.	Coast Artillery.
J. L. Webb.	College.	Field Artillery, U. S. R.
P. R. Wiggins.	College.	Hospital Service, San Domingo.
F. H. Wilson.	College (A. B., 1917).	2nd Lt., Engineers, U. S. R.
E. S. Wood.	Engineering.	Naval Reserves.
W. A. Wood.	Engineering (B.S., 1917).	2nd Lt., Engineers, U. S. R.
R. H. Woodward.	College.	Ensign, U. S. N.
J. W. Young.	Engineering.	Naval Reserves.
L. M. Young.	Engineering (B.S., 1917).	Aviation Corps (England).

REPORT OF THE DIRECTOR OF THE COLLEGE COURSES FOR TEACHERS

TO THE PRESIDENT OF THE UNIVERSITY:

I have the honor to submit the following report on the work of the College Courses for Teachers, conducted in co-operation with Goucher College, during the academic year, October 9, 1916, to May 26, 1917.

This is the eighth year of these courses, the plans for which are stated in detail in the *University Circular* of June, 1916. Of the courses announced, instruction of collegiate grade was given in the following: History of Art; Chemistry; Education I, II, III, IV and V; English I, II and III; French I, II and III; German I, IIA, IIB and III; History; Hygiene; Italian; Mathematics; History of the Ancient East, History of Israel, Biblical Archaeology, and Literature of the Bible; Political Economy I, II and III; Psychology I and II; Spanish I and II. Owing to the small registration, the course announced in Latin was not given. Political Economy IV (Life Insurance) was transferred, so as to be given under the auspices of the newly organized Courses in Business Economics. At the opening of the session, two new courses were added: Educational Measurements, by Professor Bird T. Baldwin, of Swarthmore College, newly appointed Lecturer in Education; and Genetic Psychology, by Professor Howard C. Warren, of Princeton University, newly appointed Fellow by Courtesy. Education IV was conducted after December by Dr. David E. Weglein, Fellow by Courtesy. These courses were conducted by thirty-one instructors, six of whom were members of the staff of Goucher College, the remainder of the University.

The enrollment in the courses was four hundred twenty-nine the first half-year, and three hundred sixty the second half-year, the total enrollment for the year being four hundred thirty-six, an increase of ninety-three over the preceding year. Forty-three of these were duplicate registrations from other divisions of the University, as follows: Twenty graduate, three medical, seventeen academic, and three engineering. The primary registration of the year in the College Courses for Teachers was three hundred ninety-three, an increase of ninety-seven over the preceding year. Eighty-seven were men and three hundred forty-nine were women. Of the three hundred forty-three students registered in the courses last year, ninety-two continued their registration this year. This gratifying number indicates a growing stability in the registrations in this division of the University, which we may reasonably expect to increase owing to the establishment of the Bachelor of Science degree. There were twenty-nine graduate students among those primarily registering in these courses. This is an increase of nearly fifty per cent. in the corresponding group of last year, and indicates that instructional

service in these courses supplements the usual college course and is correspondingly vocationalized. The amount of work accomplished is best indicated by the following figures: Four students registered in seven courses, six in six courses, two in five courses, five in four courses, eleven in three courses, fifty-three in two courses, and three hundred fifty-five in one course, each. The increased amount of work undertaken by some of these students is due to the new situation in which candidates for the degree of Bachelor of Science are giving full time to the work leading to the degree. There were fifty candidates for the degree attending the courses this year. The remaining three hundred eighty-six were, accordingly, and for the first time, listed as special students.

The occupational distribution of the persons registered continues to indicate the widening range of professional and commercial interests in our community which the University is serving: Teachers and those in preparation for teaching, two hundred sixty-seven; no occupation, sixty-two; students, fifty-three; social workers and nurses, twenty-four; secretaries, etc., thirteen; clergymen, three; manufacturers, three; merchants, two; a single representative of each of the following: agent of the United States Department of Agriculture, librarian, physician, lawyer, sculptor, photographer, water engineer, insurance agent, and bookkeeper.

The annual conference of the presidents and deans of the two institutions, with the instructors in these courses, was held on May 19, 1917. The following amounts of credit for the courses were recommended and authorized: History of Art, six points; Chemistry, six points; Education I, six points (for a grade of eight or more), four points (for a grade of six or less than eight); Education II, six points (for a grade of eight or more), four points (for a grade of six or less than eight); Education III, two points; Education IV, six points (for a grade of eight or more), four points (for a grade of six or less than eight); Education V, two hours, six points (for a grade of eight or more), four points (for a grade of six or less than eight), third hour on Supervision, two points additional; Educational Measurements, six points (for a grade of eight or more), four points (for a grade of six or less than eight); English I, six points (for a grade of eight or more), four points (for a grade of six or less than eight); English II, six points; English III, six points (for a grade of eight or more), four points (for a grade of six or less than eight); French I, eight points; French II, four points; French III, six points; German I, eight points; German IIA, three hours, eight points (for a grade of eight or more), six points (for a grade of six or less than eight), two hours, six points (for a grade of eight or more), four points (for a grade of six or less than eight); German IIB, four points; German III, six points; History, six points; Hygiene, six points; Italian, six points; Mathematics, six points; History of the Ancient East, from two to three points; History of Israel, two points; Biblical Archaeology, two points; Biblical Literature, two points; Political Economy I, six points; Political Economy II, six points; Political Economy III, six points; Psychology I, four points, with laboratory, three points additional; Psychology II, from four to six points; Genetic Psychology, three points; Spanish I, six points;

Spanish II, six points. It was voted that all credits recommended be made a matter of permanent record in the office of the Registrar, as heretofore.

In October, 1916, the Trustees of the University conferred the degree of Bachelor of Science upon Mary Stella Johnson, of Georgia, who had completed the requirements during the preceding session of the Summer Courses. On June 12, 1917, the degree was conferred upon Agnes Emilie Buchholz and Elsie Louise Wirth, both of Baltimore.

EDWARD F. BUCHNER,
Director.

REPORT OF THE DIRECTOR OF THE SUMMER COURSES

TO THE PRESIDENT OF THE UNIVERSITY:

I have the honor to present the following report of the seventh session of the Summer Courses of the University, which was held during the six weeks from June 26 to August 7, 1917.

The co-operation with other agencies in the preparation and perfection of the plans for the session was more marked in this than in any former session. The Maryland Institute, which had conducted a summer session in 1916, co-operated with the University to the extent of including its summer faculty and courses entire as the department of Fine Arts of the session. With the exception of the elementary instruction in drawing, these courses were given academic recognition and duly credited towards the Bachelor of Arts and Bachelor of Science degrees. This closer connection between the Maryland Institute and the University was pursuant upon the completion of plans during the last regular session whereby work at the Institute could be offered in partial fulfillment of the requirements of a major in fine arts for the Bachelor of Science degree. The continued benefits of the survey of education in Maryland by the General Education Board became more apparent during this year. The new legal requirements, affecting particularly the certification of educational officials and teachers, made it possible to secure more definite selection of departments and courses for the benefit of prospective students. In further extension of the benefits of this survey, the General Education Board generously delegated Dr. Frank P. Bachman to conduct a week's conference with the County Superintendents at the University on the administrative features of the new school law. State and county superintendents continued to give their assistance in making the opportunities of the University more distinctly serviceable in meeting the needs of the State. The Carnegie Foundation for International Peace again placed this university upon its list of institutions in whose summer sessions it maintained, by gift, courses in international law and Spanish in their relation to American and international affairs. The Board of School Commissioners of Baltimore continued to co-operate with the University by supplying the equipment in domestic science and manual training, and in furnishing some materials of instruction for the graded demonstration school. The Directors of the Park School of Baltimore generously gave the use of their school-room equipment and much of their distinctive material of instruction for use in both the graded and rural demonstration schools. The A. N. Palmer Company, of New York, continued to make provision for instruction in penmanship. As in former years, the Peabody Conservatory continued its extended co-operation. Special gifts were received from three anonymous donors for the support of summer instruction in the department of Semitics.

The scope of the instruction offered included a total of one hundred four courses in the twenty-three subjects listed below. Classical Archaeology, Fine Arts, Philosophy, and Semitics were the subjects offered for the first time. Of the courses announced, Classical Archaeology, Chemistry 3, Education 4, Geography 1, Mathematics 3 and 4, Philosophy 2, Physics 1 and 2, and Semitics 1 and 3 were not given. In response to special demands, unannounced courses were given in Advanced Organic Chemistry, Qualitative Analysis, Integral Calculus in place of Mathematics 3, and Advanced Algebra in place of Mathematics 4. Fine Arts 8 and 9 were combined into a single course; as also, in part, Manual Training 1 and 2.

The persons appointed to give instruction were as follows:

Biology 3 courses.

Howard E. Enders, Instructor in Summer Courses.

Charles E. Montgomery, Assistant.

Chemistry 6 courses.

J. Elliott Gilpin, Professor.

Benjamin F. Lovelace, Associate Professor.

Ellis Miller, Instructor.

Louise Talbot, Laboratory Assistant.

Classical Archaeology 1 course.

Ralph V. D. Magoffin, Associate Professor.

Domestic Science 3 courses.

May Secrest, Instructor in Summer Courses.

Economics 3 courses.

Nathaniel R. Whitney, Instructor in Summer Courses.

Education 23 courses

Alda L. Armstrong, Instructor in Summer Courses.

Frank P. Bachman, Instructor in Summer Courses.

Bird T. Baldwin, Instructor in Summer Courses.

Florence E. Bamberger, Instructor.

Julia F. Beck, Teacher in Graded Demonstration School.

Anna Brochhausen, Instructor in Summer Courses.

Helen M. Burnett, Teacher in Graded Demonstration School.

Clarence G. Cooper, Instructor in Summer Courses.

Ida V. Flowers, Teacher in Graded Demonstration School.

Thomas W. Gosling, Instructor in Summer Courses.

William J. Holloway, Instructor in Summer Courses.

George L. Jones, Instructor in Summer Courses.

Edith A. Lathrop, Instructor in Summer Courses.
 C. Ethel MacRoberts, Instructor in Summer Courses.
 Frederick A. Merrill, Instructor in Summer Courses.
 Persis K. Miller, Lecturer in Summer Courses.
 Beessie G. Reinhold, Assistant in Rural Demonstration School.
 Willard S. Small, Instructor in Summer Courses.
 Maude B. Smith, Teacher in Graded Demonstration School.
 Matilda Srager, Teacher in Graded Demonstration School.

English Composition 4 courses.

Ernest J. Becker, Instructor in Summer Courses.
 Chilton L. Powell, Instructor.

English Literature 4 courses.

Chilton L. Powell, Instructor.
 James W. Tupper, Instructor in Summer Courses.

Fine Arts 11 courses.

George A. Conlon, Instructor in Summer Courses.
 Henry A. Roben, Instructor in Summer Courses.
 Carol M. Sax, Instructor in Summer Courses.
 Edith H. Stewart, Instructor in Summer Courses.
 C. Y. Turner, Instructor in Summer Courses.
 Charles H. Webb, Instructor in Summer Courses.

French 3 courses.

Gustav Gruenbaum, Instructor.

Geography 2 courses.

David G. Thompson, Instructor in Summer Courses.

German 5 courses.

Robert B. Roulston, Associate.
 Henry Wood, Professor.

History 4 courses.

Elbert J. Benton, Instructor in Summer Courses.
 Howard V. Canter, Instructor in Summer Courses.

Latin 2 courses.

Howard V. Canter, Instructor in Summer Courses.

Manual Training 3 courses.

George M. Gaither, Instructor in Summer Courses.

<i>Mathematics</i>	4 courses.
Arthur B. Coble, Associate Professor.	
<i>Penmanship</i>	2 courses.
Jack London, Instructor in Summer Courses.	
<i>Philosophy</i>	2 courses.
Henry Slonimsky, Associate.	
Israel I. Efros, Instructor in Summer Courses.	
<i>Physics</i>	5 courses.
Joseph S. Ames, Professor.	
A. Herman Pfund, Associate Professor.	
<i>Politics</i>	2 courses.
Arthur C. Millsbaugh, Instructor in Summer Courses.	
<i>Psychology</i>	4 courses.
Knight Dunlap, Professor.	
George R. M. Wells, Instructor in Summer Courses.	
<i>Semitics</i>	6 courses.
Frank R. Blake, Associate.	
Aaron Ember, Associate Professor.	
<i>Spanish</i>	2 courses.
Erasmo Buceta, Instructor.	

Nineteen of the instructors and assistants were members of the University. To these were added the following representatives of other institutions and school systems: Dr. Frank P. Bachman, of the General Education Board; Professor Bird T. Baldwin, of Swarthmore College; Miss Julia F. Beck, Practice Teacher, Baltimore City Schools; Dr. Ernest J. Becker, Principal, Eastern High School, Baltimore; Professor Elbert J. Benton, of Western Reserve University; Principal Anna Brochhausen, of the Indianapolis Public Schools; Miss Helen V. Burnett, Grade Teacher, Baltimore City Schools; Associate Professor Howard V. Canter, of the University of Illinois; Mr. George A. Conlon, of the Maryland Institute; Mr. Clarence G. Cooper, Assistant Superintendent of Schools of Baltimore County, Maryland; Dr. Israel Efros, of Baltimore; Professor Howard E. Enders, of Purdue University; Miss Ida V. Flowers, Practice Teacher, Baltimore City Schools; Mr. George M. Gaither, Supervisor in the Baltimore Public Schools; Dr. Thomas W. Gosling, Principal, The Lafayette Bloom Junior High School, Cincinnati, Ohio, *vice* E. H. Kemper McComb, Acting Principal of the Manual Training High School, Indianapolis, Ind., who resigned shortly before the opening of the session; Superintendent William

J. Holloway, of Wicomico County, Maryland; Mr. George L. Jones and Miss Alda L. Armstrong, of the Maryland Children's Aid Society; Miss Edith A. Lathrop, of the United States Bureau of Education; Mr. Jack London, of the Palmer School of Penmanship; Miss C. Ethel MacRoberts, of Franklin High School, Reisterstown, Maryland; Professor Frederick A. Merrill, of State Normal School, Athens, Georgia; Principal Persis K. Miller, of the Baltimore City Schools; Dr. Arthur C. Millsbaugh, of Whitman College; Mr. Charles E. Montgomery, of Purdue University; Miss Bessie G. Reinhold, Teacher in the Baltimore County Schools; Mr. Henry A. Roben, of the Maryland Institute; Mr. Carol M. Sax, of the Maryland Institute; Miss May Secrest, Head of Household Arts Department, State Polytechnic School, San Luis Obispo, California; Principal Willard S. Small, of the Eastern High School, Washington, D. C.; Miss Maude B. Smith, Teacher in the Baltimore County Schools; Miss Matilda Srager, Grade Teacher, in the New York City Schools; Miss Edith H. Stewart, of the Maryland Institute; Mr. David G. Thompson, of Goucher College; Professor James W. Tupper, of Lafayette College; Mr. C. Y. Turner, of the Maryland Institute; Mr. Charles H. Webb, of the Maryland Institute; Professor George R. M. Wells, of Ohio Wesleyan University, who was appointed Assistant in Psychology at the opening of the session; and Assistant Professor Nathaniel R. Whitney, of Iowa State University.

The enrolment numbered five hundred eighteen. Of these, one hundred forty-seven, or over 28 per cent., were men, and three hundred seventy-one, or nearly 72 per cent., were women. The total number of course registrations was one thousand two hundred ninety-nine, the average number of courses taken per student being 2.5. The distribution of these elections was as follows: One course was taken by fifty-four students; two courses, by one hundred sixty-six; three courses, by two hundred seventy-nine, and four courses, by nineteen, each. Four hundred five, or 78.2 per cent., of the students were administrative and supervisory officers, teachers or prospective teachers in state and county systems, colleges, normal schools, public and private schools. Sixty-five, or 12.5 per cent., were students in colleges, normal schools and other institutions. Twenty, or nearly 4 per cent., represented twelve other occupations, and twenty-eight, or 5.4 per cent., were engaged in no occupation. One hundred three students held academic or professional degrees from fifty-one institutions.

The geographical distribution of the students was as follows: Maryland was represented by four hundred fifty-one students, of whom three hundred six, or 59 per cent., were from the counties, and one hundred forty-five, or 28 per cent., from Baltimore City; twenty-one other states, the District of Columbia, Porto Rico and Persia, by sixty-seven, or 13 per cent. For the third time, each of the twenty-three counties of Maryland was represented among the student body.

This was the third year of graduate work in the summer program, which continues to be attractive to a large number of students. The registration of one hundred two graduate students was a decrease of eight from the registration in 1916. Many of these

students made formal application for admission as graduate students. Under the new Maryland school law, this grade of activity at the University enables many high school teachers and others to secure the supplementary summer work which is called for by their legal status.

In connection with the course on educational administration, a special conference on state and county administration in Maryland was conducted by Dr. Frank P. Bachman, of the General Education Board, from July 9 to 13, inclusive. The lectures and the round table discussions following considered the following topics: The Educational Principles Underlying the State School Law; The Distribution of Duties among County School Officers; Social and Professional Bases of the Certification of Teachers; The Meaning of Professional School Administration; and Supervision and Improving the Quality of Instruction. As a result of this work, the state and county school officials found their administrative problems set in a perspective which should enable them to carry out more effectively the administration of the new school law.

The most distinctive new feature of the session was the maintenance of the graded elementary demonstration school. The new buildings and grounds at Homewood made it physically possible to undertake the organization of such a school, which was conducted as a laboratory for a number of University courses in education. Such a school has been needed since the beginning of the summer work, but the limitations of the old quarters made it impossible for the University to undertake its organization and maintenance. The Board of School Commissioners of Baltimore City joined the University in extending to this demonstration school the nature of a city vacation school, wherein non-promoted and retarded pupils were given opportunity to make up deficiencies and thus gain promotion at the beginning of the next academic year. The school was conducted without expense to the pupils who might be received in the classes provided, namely,—the first, second, fourth, fifth, sixth, and seventh grades. The school proved to be very popular. Over three hundred applications for enrolment were received from children in Baltimore and the suburbs. Owing to the limitations of the class rooms only one hundred fifty-five were enrolled. The work in these grades was so arranged as to enable the University to realize three definite purposes: To give helpful instruction to the pupils directly; to provide specific demonstrations of improved methods of teaching and school organization; and to conduct experimental investigations in the physical and mental development of children and their progress in school studies, which was carried on in the course arranged for this purpose. Many of the children succeeded in making their promotion. The University courses in elementary education were made more helpful. And it is expected that the results of the investigations conducted by the University students will shortly be published as a contribution in the field of experimental education. The more or less complete realization of these three purposes will justify the University in maintaining a graded elementary demonstration school as a regular part of the summer courses in the future.

The rural graded demonstration school was continued, with an enrolment of twenty-one children who were brought in daily from the

vicinity of Catonsville. The maintenance of the graded elementary demonstration school made it possible, for the first time, for the rural demonstration school to direct its attention exclusively to the realization of the primary purpose for which it was organized, namely, to give particular assistance, in both organization and method, to those who are laboring under the complex requirements of the Maryland state elementary course of study.

As a part of the work in connection with the observation in the graded elementary demonstration school, there was conducted a series of conferences which, with a few exceptions, were based on demonstrations given in the grades, as mentioned below. The conference was held at seven thirty a. m., which proved to be a very attractive hour, the attendance ranging from fifty to one hundred seventy-five. The first three topics presented the newer developments in elementary school organization, which have appeared under the leadership of Miss Persis K. Miller, Principal of Public School Number 76, Locust Point, Baltimore.

June 27—Miss Miller, Health.

" 28—Miss Miller, Vocational Adjustment.

" 29—Miss Miller, Thrift.

July 2—Professor Baldwin, Use of Standard Tests.

" 3—Miss Brochhausen, Primary Reading and Phonics.

" 5—Miss Bamberger, Grammar.

" 6—Professor Merrill, School Gardens.

" 9—Miss Bamberger, How to Study.

" 10—Miss Brochhausen, Spelling.

" 11—Miss Brochhausen, Primary Arithmetic.

" 12—Miss Bamberger, Arithmetic, grammar grades.

" 13—Miss Bamberger, Reading, grammar grades.

" 16—Mr. Jones, Re-education of the Returned Soldier.

" 17—Miss Brochhausen, Oral language, primary grades.

" 18—Miss Bamberger, Oral language, grammar grades.

" 19—Miss Brochhausen, Reading and Dramatization.

" 20—Miss Secrest, Domestic Science.

" 23—Miss Brochhausen, Written Composition.

" 24—Miss Brochhausen, Teaching a Poem.

" 25—Miss Bamberger, History and Civics.

" 26—Miss Bamberger, Project-Problem Method.

" 27—Professor Merrill, Home Geography.

" 30—Mr. Sax, Art Instruction in Elementary Schools.

" 31—Superintendent Cooper, Hygiene.

Aug. 1—Professor Merrill, Agriculture.

" 2—Superintendent Holloway, Class Management.

" 3—Professor Baldwin, Summary of Tests.

The tables on pages 105-107 present a survey of the work done by the students in so far as this may be gathered from a list of the courses given in the several subjects, the courses allowed academic credit, the enrolment in each, and the number taking examinations at the close of the session.

As we have long since come to expect, the students exhibited characteristic earnestness in carrying forward the work of the different courses. Under our system of voluntary examinations, 86.7 per cent. completed their work by taking examinations at the close of the session.

The series of Friday evening lectures and entertainments of a more popular character, Sunday afternoon organ recitals, and Wednesday afternoon art exhibits, open to the public, were made especially attractive through the cordial co-operation of the summer session of the Peabody Conservatory of Music and the Maryland Institute. The programs were as follows:

June 27—Exhibition of Students' Art Work.

June 29—Professor Ralph V. D. Magoffin, of the University, "*Roma Imperatrix Mundi.*"

July 1—Mr. John Denues.
Organ Recital.

July 4—Municipal Community Singing Concert (Druid Hill Park).

July 6—Mr. George F. Boyle, Pianist, and Mr. J. C. Van Hulsteyn,
Violinist, of the Conservatory.
Recital.

July 8—Organ Recital.

July 9—Mr. Peter H. Goldsmith, Director, Pan-American Division,
American Association for International Conciliation.
"Beauty in South America, as Revealed in Nature and Art."

July 11—One hundred Etchings and Engravings from the work of
Fantin-Latour.

July 13—Professor Bird T. Baldwin, of Swarthmore College and the
University.
"An Evening with Leading Contemporary Educators and Psychologists."

July 15—Organ Recital.

July 18—Exhibition of Paintings by C. Y. Turner, Director of the
Institute.

July 20—Mr. Harold D. Phillips, Organist, and Mr. Bart Wirtz, 'Cellist,
of the Conservatory.
Recital.

July 22—Organ Recital.

July 25—Exhibition of Paintings, work of Baltimore artists.

July 27—Professor J. Elliott Gilpin, of the University.
“Chemistry and the War.”

July 29—Organ Recital.

August 1—Exhibition of the Lucas Collection of Paintings and
Barye Bronzes.

August 3—Eugene Martenet, Baritone, of the Conservatory.
Recital.

The social welfare of the members of the faculty and student body received attention. The Directors gave a reception to the two faculties at the Johns Hopkins Club, Carroll Mansion, Homewood, on Monday evening, June 25. The opening and closing receptions by the University and Conservatory were given to the faculties and students on Friday evenings, June 29 and August 3. The former was given in Gilman Hall, Homewood, and the latter, in the Peabody Art Gallery. A Saturday excursion was taken to Annapolis, July 4; and also to Washington, upon invitation of Dr. P. P. Claxton, United States Commissioner of Education, on July 28.

EDWARD F. BUCHNER,

Director.

Subjects and Courses *	Points Credit	Enroll- ment	Number taking Examina- tions
Biology			
General Biology.....	4	25	21
Zoology	3	11	11
The Teaching of Botany in Secondary Schools	4	4	4
Chemistry			
Organic Chemistry.....	Grad.	4	4
Advanced Inorganic Chemistry.....	Grad.	4	2
Quantitative Analysis.....	Grad.	3	2
Qualitative Analysis.....	Grad.	1	1
Advanced Organic Chemistry.....	Grad.	1	1
Household and Textile Chemistry.....	3	9	7
Introduction to General Chemistry.....	4	11	7
Domestic Sciences			
Advanced Cookery.....	3	6	6
Elementary Cookery.....	3	6	5
Methods of Teaching Domestic Science..	2	9	7
Economics			
Social Reforms.....	Grad.	7	5
Elements of Economics.....	3	14	11
Economic History.....	3	5	5
Education			
Experimental Education.....	Grad.	23	21
Educational Psychology.....	Grad.	26	32
Educational Administration.....	Grad.	17	16
High School Organization.....	Grad.	41	39
The Teaching of Literature in Secondary Schools	3	22	20
The Teaching of English Composition in Secondary Schools.....	3	25	22
The Teaching of Mathematics in Sec- ondary Schools.....	3	14	11
The Teaching of Science in Secondary Schools	3	10	9
The Teaching of Agriculture in Second- ary Schools.....	3	4	4
School Management.....	2	15	14
Graded Demonstration School.....	1	98	85
Elementary School Supervision.....	3	22	20
Grammar Grade Methods.....	3	29	26
Primary Grade Methods.....	3	55	48
The Teaching of English in the Elemen- tary School.....	3	70	54
The Teaching of Arithmetic and Geogra- phy in the Elementary School.....	3	50	45
The Teaching of Agriculture in the Ele- mentary School.....	3	13	13
Supervision of Rural Schools.....	2	12	10
Rural School: Methods Course.....	3	39	39
Rural Demonstration School.....	2	39	39
The Principles of Elementary Teaching..	2	27	25
School Law and School Management....	2	19	19

* See top of page 103.

Subjects and Courses *	Points Credit	Enroll- ment	Number taking Examina- tions
<i>English Composition</i>			
Practical Writing.....	3	19	17
Advanced Composition.....	3	8	7
Elements of English Composition.....	0	10	7
English Grammar.....	0	5	4
<i>English Literature</i>			
Wordsworth and Coleridge.....	Grad.	11	9
English Drama.....	Grad.	8	7
Chaucer	Grad.	2	2
English Literature, 1775-1892.....	3	16	15
<i>Fine Arts</i>			
Life and Portrait.....	2	11	11
Life and Portrait (Section 2).....	2	7	7
Landscape and Still-Life in Oil Painting.	2	5	5
Landscape and Still-Life in Oil Painting			
(Section 2).....	2	5	4
Landscape Sketching, Water Color.....	2	9	7
Elementary School Color Work.....	2	6	6
The Theory and Practice of Teaching Art	2	2	1
Principles of Design.....	2	9	9
Principles of Design (Section 2).....	2	9	9
Drawing	2	2	2
Elementary Drawing.....	0	6	5
<i>French</i>			
The Romantic Period.....	Grad.	7	6
Readings in French.....	3	11	6
Elementary French.....	3	24	17
<i>Geography</i>			
Economic and Commercial Geography...	3	11	8
<i>German</i>			
The Period of "Sturm und Drang" in			
German Literature, 1772-1785.....	Grad.	1	1
German Literary Style, &c.....	Grad.	4	4
Practical Exercises.....	Grad.	7	2
Readings in German.....	3	8	5
Elementary German.....	0	11	6
<i>History</i>			
American History, 1763-1795.....	Grad.	8	5
American History since 1783.....	3	18	18
European History from Charlemagne to			
the Eighteenth Century.....	3	18	12
Roman History.....	3	5	4
<i>Latin</i>			
The Teaching of Omsar in Secondary			
Schools	3	8	7
Virgil: Aeneid I-VI.....	0	6	6

* See top of page 108.

Subjects and Courses *	Points Credit	Enroll- ment	Number taking Examina- tions
<i>Manual Training</i>			
Bench Work in Wood and Mechanical Drawing	3	6	6
Elementary Manual Training	3	16	15
The Theory and Practice of Teaching Manual Arts	2	6	4
<i>Mathematics</i>			
Elliptic Functions	Grad.	2	2
Projective Geometry and the Algebra of Forms	Grad.	2	1
Advanced Algebra	3	7	5
Integral Calculus	3	3	1
<i>Penmanship</i>			
Penmanship	0	24	24
Methods of Teaching Penmanship	0	10	9
<i>Philosophy</i>			
Typical Views of Life	Grad.	16	11
<i>Physics</i>			
Mechanics and Heat	0	7	6
Electricity and Magnetism	0	3	3
Teachers' Course in General Physics	0	8	3
<i>Politics</i>			
International Relations	Grad.	4	4
International Arbitration	Grad.	4	3
<i>Psychology</i>			
Research in Psychology	Grad.	5	4
Real and Apparent Problems in Psychology	Grad.	19	16
Training Course in Laboratory Psychology	Grad.	2	2
Introduction to General Psychology	3	29	27
<i>Semitics</i>			
Grammar of the Aramaic Idiom of the Babylonian Talmud	Grad.	2	2
Elementary Hebrew	2	3	3
History of the Ancient East	Grad.	10	7
Literature of the Old Testament in the Light of Modern Critical Theories	3	5	3
<i>Spanish</i>			
Advanced Spanish	3	9	8
Elementary Spanish	3	11	7

* See top of page 103.

REPORT OF THE DEAN OF THE MEDICAL FACULTY

TO THE PRESIDENT OF THE UNIVERSITY:

I have the honor to submit the following report of the activities of the Medical Department of the University during the year ending September 30, 1917.

The total enrollment of candidates for the degree of Doctor of Medicine was 362. Four students withdrew for various causes, reducing the number to 358 at the end of the academic year.

Upon the recommendation of the Advisory Board of the Medical Faculty, the University conferred the degree of Doctor of Medicine upon two students on February 22nd, upon two on May 1st, and upon eighty-eight at the Commencement, June, 1917, making a total of 92.

Fourteen physicians registered for special instruction in various branches of medicine and surgery during the year, and sixty physicians were enrolled for the summer courses offered to graduates in medicine during the six weeks beginning June 1st, 1917.

Four hundred and seventy persons made inquiry concerning admission to the 1917-18 session, of whom 212 filed formal applications. On account of uncertainty concerning the effect of the draft upon the enrollment, it was thought advisable to accept a larger number of students than usual, so that eventual losses would not reduce the number of students too greatly. Accordingly, on July 15, 1917, 116 applicants were accepted for the first year class and twenty-eight for advanced standing, with the result that the actual registration on October 1st was:

First Year.....	92
Second Year.....	94
Third Year.....	97
Fourth Year.....	89

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Five students were admitted with conditions,—three in French and two in German.

The most important occurrences in the school during the year were the changes incident to the organization of the School of Hygiene. On April 26, 1917, Dr. Welch resigned the professorship of Pathology which he had held since 1884, to become Director of the new school, and this necessitated the appointment of a successor. The University was fortunate in obtaining for the post Dr. William George MacCallum, Professor of Pathology in Columbia University, a graduate of the first class of this school and afterwards a member of its Faculty in various capacities. Dr. Ford, Associate Professor of Bacteriology in the Medical School, was

likewise transferred to the School of Hygiene with a similar title. The changes in the department of Pathology called for an increased expenditure, made possible by a generous gift from the Rockefeller Foundation, which furthermore enabled us to increase the activities of the departments of Pharmacology, Physiological Chemistry, and Pediatrics.

The organization of the School of Hygiene will entail still other changes and reorganizations. A committee consisting of Drs. Howell, Howland, Jones and Lewis, has been appointed to consider the matter and to make an exhaustive report to the Medical Faculty during the coming year.

In accordance with the desire of the War Department, a course of lectures on Military Administration, Sanitation and Surgery was given to the fourth year students during the months of March, April and May by Dr. Taylor E. Darby, Captain, Medical Corps, U. S. Army. These lectures were well attended and served to increase the interest of the students in military medical affairs.

The Johns Hopkins Base Hospital, now the United States Army Base Hospital No. 18, was called into service in June. This brought about extensive changes in our teaching staff and in the student body, for the reason that Doctors Finney, Boggs, Baer, Guthrie, Heuer, W. A. Baetjer, Bernheim, Bridgman, Fisher, Stone, J. H. King, Slack and Waters went with it as medical officers, and two third year students and thirty-two fourth year students accompanied it as enlisted men. Notwithstanding the absence of these teachers from the school, arrangements have been made to carry on the work with undiminished vigor. The students serving as enlisted men were assured of medical instruction in France and were told that their work in the Base Hospital would be accepted by the University so far as recommended by Doctors Finney and Boggs. In addition to the thirteen members of the Faculty who accompanied the Base Hospital to France, forty-seven other members of the University or Hospital staff have entered the medical services of the nation. A list has been prepared giving their names, titles and assignments up to November 1st, and will be published in the catalogue for 1917-1918.

In view of the increasing cost of medical education new sources of revenue were looked for, and it was decided to increase the fees for tuition from \$240 to \$250 per year, beginning with October, 1918.

The physical examination of the medical students has been continued as in former years, but in order to make it more valuable the Faculty agreed to the recommendation of Dr. Janeway that the examinations should be made more intensive, and the records kept in such a way that they may be immediately available throughout the entire period of residence of the students. It is confidently expected that these changes will aid in the prompter recognition of incipient disease and thus enable a certain number of students to be treated, so that they may continue with their work instead of withdrawing from the school as formerly.

I regret to report that five of our alumni died during the year, viz., Clifton M. Faris (1905), November 16, 1916; Neil D. Graham

(1901), August 25, 1916; Walter C. Haupt (1914), June 3, 1917; Henry D. Long (1903), October 23, 1916, and Douglas H. Morse (1910), May 8, 1917.

After this report had been completed the entire Medical School was shocked by the unexpected death (November 17, 1917) of Dr. Franklin Paine Mall, Professor of Anatomy since its opening. This is not the place to call attention to the exceptional value of his services, nor to the great loss which the University has sustained, but I would call your attention to the fact that it is the first death to occur in the Medical Faculty as organized in 1893.

During the year the following members of the teaching staff resigned:

- Dr. William H. Welch, Professor of Pathology, to become Director of the School of Hygiene.
- Dr. William W. Ford, Associate Professor of Bacteriology and Hygiene, to become Associate Professor of Bacteriology in the School of Hygiene.
- Dr. Milton C. Winternitz, Associate Professor of Pathology, to become Professor of Pathology, Yale University.
- Dr. William McK. Marriott, Associate Professor of Pediatrics, to become Professor of Pediatrics, Washington University, St. Louis.
- Dr. Montrose T. Burrows, Associate in Pathology, to become Associate Professor of Pathology, Washington University, St. Louis.
- Dr. Edmund V. Cowdry, Associate in Anatomy, to become Professor of Anatomy, Peking Union Medical College (under Rockefeller Foundation), China.
- Dr. Paul G. Shipley, Instructor in Anatomy, to become Instructor in Pediatrics.
- Dr. Charles A. Laubach, Instructor in Bacteriology, to become Assistant, City Health Department, Baltimore.
- Dr. Everett D. Plass, Instructor in Obstetrics, to enter military service.
- Dr. Norman M. Keith, Instructor in Medicine, to enter military service.
- Dr. Warren R. Sisson, Instructor in Pediatrics.
- Dr. Walter R. Holmes, Instructor in Gynecology, to enter military service.
- Dr. Daniel Davis, Instructor in Obstetrics, to enter military service.
- Dr. J. Cushman Lyman, Assistant in Pathology, to enter military service.
- Dr. Raymond S. Hussey, Assistant in Pathology, to enter military service.
- Dr. Joseph S. Lawrence, Assistant in Bacteriology, to become Bacteriologist-Pathologist, State Department of Health, Albany, N. Y.
- Dr. Virgil P. W. Sydenstricker, Assistant in Medicine, to enter military service.
- Dr. Hiram Fried, Assistant in Medicine.
- Dr. George B. Wislocki, Assistant in Anatomy.
- Dr. Samuel W. Clausen, Assistant in Medicine.

- Dr. Lloyd B. Whitham, Assistant in Ophthalmology.
 Dr. Samuel S. Watkins, Assistant in Laryngology.
 Dr. Charles L. McCarthy, Assistant in Laryngology, to enter United States Navy.
 Dr. Howard E. Ashbury, Assistant in Clinical Orthopedic Surgery, to enter military service.
 Miss Cathryn Riley, Assistant in Bacteriology.

New appointments and promotions were as follows:

I. *New Appointments*

- Dr. William G. MacCallum, Professor of Pathology.
 Dr. N. Worth Brown, Lecturer in Medicine.
 Dr. Omer Van der Stricht, Lecturer in Anatomy.
 Dr. David W. Carter, Jr., Instructor in Medicine.
 Dr. Benjamin Kramer, Instructor in Pediatrics.
 Dr. William L. Millea, Instructor in Obstetrics.
 Dr. J. Howard Müller, Instructor in Pathology.
 Dr. Thomas W. Rivers, Instructor in Pediatrics.
 Dr. Augusta R. Scott, Instructor in Psychiatry.
 Dr. Paul G. Shipley, Instructor in Pediatrics.
 Dr. Herbert M. N. Wynne, Instructor in Gynecology.
 Dr. Nathaniel H. Brush, Instructor in Psychiatry.
 Dr. G. Bedford Brown, Assistant in Laryngology.
 Dr. Paul W. Christman, Assistant in Pathology.
 Dr. Janet Howell Clark, Assistant in Pathology.
 Dr. Stanley Cobb, Assistant in Psychiatry and Physiology of the Nervous System.
 Dr. Philip S. Evans, Assistant in Physiology.
 Dr. Ruth E. Fairbank, Assistant in Psychiatry.
 Dr. William C. von Glahn, Assistant in Pathology.
 Dr. Phyllis Greenacre, Assistant in Psychiatry.
 Dr. Esau A. Greenspon, Assistant in Pathology.
 Dr. Ruth A. Guy, Assistant in Bacteriology.
 Dr. John W. Harris, Assistant in Obstetrics.
 Dr. George A. Harrop, Assistant in Medicine.
 Dr. Alfred C. Kolls, Assistant in Pharmacology.
 Dr. Fred H. Kruse, Assistant in Medicine.
 Dr. Esther L. Richards, Assistant in Psychiatry.
 Dr. Eldon W. Sanford, Assistant in Anatomy.
 Dr. Alan C. Sutton, Assistant in Medicine.
 Dr. Adrian S. Taylor, Assistant in Surgery.

Clinical Staff

- Dr. Edward A. Looper, Assistant in Clinical Ophthalmology.
 Dr. Alma S. Rothholz, Assistant in Clinical Medicine.
 Dr. Daniel D. V. Stuart, Assistant in Clinical Neurology.

II. *Promotions*

- Dr. Florence R. Sabin, from Associate Professor to Professor of Histology.
 Dr. Lewis H. Weed, from Associate to Associate Professor of Anatomy.

- Dr. Eli K. Marshall, Jr., from Associate to Associate Professor of Pharmacology.
 Dr. D. Wright Wilson, from Associate to Associate Professor of Physiological Chemistry.
 Dr. Stanhope Bayne-Jones, from Instructor to Associate in Bacteriology.
 Dr. Kenneth D. Blackfan, from Instructor to Associate in Pediatrics.
 Dr. Arthur L. Bloomfield, from Instructor to Associate in Medicine.
 Dr. Admont H. Clark, from Instructor to Associate in Pathology.
 Dr. Charles C. Macklin, from Instructor to Associate in Anatomy.
 Dr. Harry C. Schmeisser, from Instructor to Associate in Pathology.
 Dr. Thomas P. Sprunt, from Instructor to Associate in Medicine.
 Dr. David I. Macht, from Lecture Assistant to Lecturer in Pharmacology.
 Dr. Marjorie D. Batchelor, from Assistant to Instructor in Medicine.
 Dr. H. Hays Bullard, from Assistant to Instructor in Pathology.
 Dr. Jonathan E. Burns, from Assistant to Instructor in Urology.
 Dr. Mildred Clark Clough, from Voluntary Assistant to Instructor in Medicine.
 Dr. Frank A. Evans, from Assistant to Instructor in Medicine.
 Dr. Lloyd D. Felton, from Assistant to Instructor in Bacteriology.
 Dr. Isidore I. Hirschman, from Assistant to Instructor in Medicine.
 Dr. John G. Murray, Jr., from Assistant to Instructor in Obstetrics.
 Dr. Clarence A. Neymann, from Assistant to Instructor in Psychiatry.

Clinical Staff

- Dr. Mary A. Hodge, from Assistant to Instructor in Clinical Medicine.
 Dr. John T. King, Jr., from Assistant to Instructor in Clinical Medicine.

The Maryland, Virginia and North Carolina Scholarships for 1916-17 were awarded as follows:

G. E. W. Hardy, W. Hughson, A. S. McCown, Elizabeth M. Reese, D. N. Shulman, and H. S. Willis.

The Joseph Kernochan Garr Scholarship was awarded to L. T. Webster.

The twenty members of the graduating class mentioned below were recommended to the Trustees of the Johns Hopkins Hospital for appointment as House Officers, and are now serving in that capacity:

Dr. W. T. Anderson	Dr. F. H. Linthicum
Dr. J. H. Baird	Dr. C. V. McMeen
Dr. L. Brady	Dr. M. D. McNeal
Dr. W. L. Brosius	Dr. T. S. Moise, Jr.
Dr. C. L. Callender	Dr. E. Novak
Dr. R. D. Fear	Dr. B. J. Sanger
Dr. H. A. Gailey	Dr. J. P. Shearer
Dr. T. O. Gamble	Dr. M. H. Tibbetts
Dr. L. B. Hohman	Dr. M. Tyler
Dr. S. E. Howard	Dr. H. S. Van Nostrand

The positions obtained by other members of the class, either by competitive examination or by personal appointment, are as follows:

- J. B. Amberson, Jr.—Interne, New Haven Hospital, New Haven.
- J. K. Anderson.—Interne, Minneapolis City Hospital, Minneapolis.
- B. E. Belcher.—Assistant Surgeon, U. S. Navy.
- W. C. Blake.—Interne, Post-Graduate Hospital, New York City.
- I. M. Blanchard.—Interne, Minneapolis City Hospital, Minneapolis.
- G. Bedford Brown.—Assistant in Laryngology.
- H. M. Bullard.—Interne, Brooklyn City Hospital, Brooklyn, N. Y.
- J. M. Carter.—Interne, Harper Hospital, Detroit, Mich.
- G. A. Clark.—Interne, Roosevelt Hospital, New York City.
- H. M. Clark.—Interne, Hospital for the Women of Maryland.
- H. P. Davidson.—Interne, New Haven Hospital, New Haven, Conn.
- K. H. Doege.—Interne, City Hospital, Bay View.
- H. P. Doub.—Externe in Roentgenology.
- H. W. Fowle.—Interne, City Hospital, Bay View.
- M. Frishman.—Interne, West Penn Hospital, Pittsburgh.
- G. L. Groover, Jr.—Interne, City Hospital, Bay View.
- R. A. Guy.—Assistant in Bacteriology.
- F. W. Hartman.—Assistant Surgeon, U. S. Navy.
- R. V. Hoffman.—Interne, Henry Ford Hospital, Detroit, Mich.
- W. P. Jackson.—Assistant Surgeon, U. S. Navy.
- L. L. Jacobs.—Interne, Hebrew Hospital, Baltimore.
- J. H. Janney, Jr.—Interne, Peter Bent Brigham Hospital, Boston.
- J. Ketzky.—Externe in Medicine.
- M. W. King.—Interne, Hospital for Women of Maryland.
- J. C. Koch.—Interne, Garrett Hospital, Mt. Airy, Md.
- A. C. Kolls.—Assistant in Pharmacology.
- H. Linden.—Interne, St. Agnes' Hospital, Baltimore.
- C. L. Lockett.—Interne, Union Protestant Infirmary, Baltimore.
- J. S. McCartney, Jr.—Interne, St. Francis' Hospital, Pittsburgh.
- H. M. Mann.—Interne, Mt. Sinai Hospital, New York City.
- K. H. Martzloff.—Interne, Lakeside Hospital, Cleveland.
- K. K. Merritt.—Interne, Children's Hospital, San Francisco.
- G. R. Micklethwaite.—Interne, Union Protestant Infirmary, Balt.
- F. A. Miller.—Interne, New Haven Hospital, New Haven, Conn.
- H. M. Nicholson.—Interne, Royal Victoria Hospital, Montreal, Can.
- L. E. Payne, Jr.—Interne, U. S. Soldiers' Home Hospital, D. C.
- D. S. Pulford, Jr.—Interne, Henry Ford Hospital, Detroit, Mich.
- R. L. Reber.—Interne, Church Home and Infirmary, Baltimore.
- J. L. Rice.—International Health Commission, Rockefeller Foundation.
- I. C. Rigglin.—Interne, U. S. Soldiers' Home Hospital, D. C.
- E. W. Schultz.—1st Lieutenant, M. O. R. C.
- R. G. Sharp.—Resident Physician, Boston Free Dispensary, Boston.
- J. W. Sherrill.—Interne, U. S. Government Hospital, Ancon, C. Z.
- G. M. Shipton.—Interne, Roosevelt Hospital, New York City.
- D. N. Shulman.—Univ. of Louisville, School of Medicine, Ky.
- E. E. Smith.—Assistant Surgeon, U. S. Navy.
- M. C. Sosman.—Interne, U. S. Soldiers' Home Hospital, D. C.
- R. H. Staehle.—Interne, Newark City Hospital, Newark, N. J.
- R. B. Stewart.—Interne, Presbyterian Hospital, Philadelphia.

C. C. Sturgis.—Interne, Peter Bent Brigham Hospital, Boston.
W. S. Summers.—Detroit Clinical Laboratory, Detroit, Mich.
W. S. Tillett.—Interne, City Hospital, Bay View.
I. M. Wason.—Interne, New York State Hospital for X-Ray, Brooklyn, N. Y.
J. B. White.—Interne, U. S. Soldiers' Home Hospital, D. C.
G. R. Wilkinson.—Interne, Hospital for Women of Maryland.
M. Wright.—Interne, Peter Bent Brigham Hospital, Boston.

Respectfully submitted,

J. WHITEEDGE WILLIAMS,
Dean.

REPORT OF THE DEPARTMENT OF ENGINEERING

TO THE PRESIDENT OF THE UNIVERSITY:

We beg to hand you herewith the Fourth Annual Report of the Department of Engineering, for the year ending June 30, 1917:

The total enrollment of students at the opening of the year was 190. Of these 21 were graduates of other institutions, 3 were special students, 142 were candidates for the degree of Bachelor of Science in Engineering, and 4 were candidates for higher degrees. There have been 3 withdrawals, reducing the enrollment at the end of the academic year to 187. Upon the recommendation of the Advisory Committee of the Department of Engineering and of the Board of University Studies respectively, the degree of Bachelor of Science in Engineering was conferred upon 37 students and the degree of Master of Arts upon one student in the Department of Engineering at the Commencement exercises held June 12, 1917.

The total number of scholarships awarded to students in Engineering during the year was 100. Most of these were regular scholarships, provided under the Legislative Act establishing scholarships in the Department of Engineering. A complete list of holders of scholarships of the several types is given at the end of this report.

The new laboratory of Civil Engineering was occupied at the beginning of this year for the first time. Much new equipment has been purchased and installed in the new laboratory, and the facilities of the Department of Civil Engineering thereby greatly extended and improved.

The Department of Engineering has aided greatly in the establishment of the University at Homewood. The laboratories and shops of the department of Physics and a part of the work of the department of Chemistry have found temporary quarters in the Mechanical and Electrical Building. The department of Geology and its allied activities, the University Y. M. C. A., two courses in undergraduate chemistry, and the course in Military Training have occupied space in the Civil Engineering Building.

The greater portion of the Evening Courses of the University have been conducted in the Mechanical and Electrical Building.

In connection with the war, the following activities of members of the Department should be noted: Professor Tilden and Mr. Weaver, members of the Engineer Officers' Reserve Corps, were called into active service several weeks before the close of the year.

Twelve students from the Department have entered the Officers' Training Camp at Fort Myer, Virginia, several of them having already received their commissions.

Students of the Department took an active part in the course in Military Training in the University. The officers of the student corps were, in great measure, drawn from students of the Department of Engineering. A number of other students have been called to work directly related to the needs of the Government, in connection with the war.

The following additions to the Faculty of Engineering were made at the beginning of the year:

John H. Bringhurst, Associate in Civil Engineering.
William J. Dana, Instructor in Mechanical Engineering.
Frederick W. Lieberknecht, Instructor in Electrical Engineering.
Julian C. Smallwood, Teaching Fellow in Mechanical Engineering.
Louise Talbot, Research Assistant in Mechanical Engineering.

Through the generosity of Mr. J. E. Aldred, there has been donated to the Department of Engineering, for several years, a fund for furthering and improving undergraduate instruction in the methods and problems of the practice of engineering. The principal feature in the use of this fund has been a course of lectures and other activities under Mr. Aldred's gift is given later in this report.

Following is a statement of the activities and courses which were given during the year in each of the branches of Engineering:

CIVIL ENGINEERING

Advanced Course

Seminary and Journal Meeting. *One hour weekly, second half-year.*
Professor Tilden.

Undergraduate Courses

Civil Engineering 1. Theory of the Strength of Materials and Elements of Structural Design. *Three lectures or recitation hours, and four hours of drafting room or laboratory work, weekly through the year.* Professor Tilden and Mr. Weaver.

Civil Engineering 2. Theory of Structures and Design. *Three lectures or recitation hours, and six hours of drafting room or field work, weekly through the year.* Mr. Bringhurst.

Civil Engineering 3. Elements of Sanitary Engineering. *Three lectures or recitation hours, and six hours of drafting room or laboratory work, weekly through the year.* Associate Professor Jones.

Civil Engineering 4. Transportation (Elective). *Two lecture or recitation hours, and three hours in drafting room or field, weekly through the year.* Professor Tilden (Railways and Canals). Associate Professor Jones (Highways).

Civil Engineering 5. Advanced Surveying (Elective). *Two lecture or recitation hours, and three hours in drafting room or field, weekly through the year.* Mr. Bringhurst (Railway Surveying). Mr. Weaver (Geodetic Surveying).

Elementary Hydraulics. *Two lectures or recitations (or one lecture and one three-hour period in the laboratory) weekly, second half-year.* Associate Professor Jones.

Engineering Drawing. Lettering, Orthographic and Isometric Projection. *Four hours in the drafting room, weekly, first half-year.* Mr. Weaver.

Surveying. The work in theory and practice of surveying, required of all Engineering students on the completion of the second year, is being given at Homewood, from June 2 to June 30, 1917, inclusive. Associate Professor Jones and Mr. Bringham.

In connection with the courses in Strength of Materials and Transportation, Professor Tilden conducted a series of field exercises in emergency bridge-building. Several of these bridge drills were held during the year and a double-lock spar bridge, of about thirty-eight feet span, with a floor nine feet wide, was built across a ravine on the University grounds. The drills were open to volunteers from the Junior and Senior classes and offered opportunity for practice in the rapid handling of heavy timbers, making the right kind of knots and lashings with ropes, and the disposition and ordering of groups of men for doing work of this kind of "man-power."

The Robert Tong Layfield Memorial Flag Staffs of the Class of 1918 were erected by student volunteers under the direction of Professor Tilden.

Several excursions have been made by the Senior class in Civil Engineering to points of engineering interest near Baltimore. These excursions were conducted as regular class exercises, and were in charge of a member of the faculty. The students were required subsequently to submit a written report covering the engineering features of each trip.

Professor Tilden delivered a lecture on "The Romance of Engineering" at the Drexel Institute in Philadelphia, and an address on "The Test of Real Values in Collegiate Education" before the annual convention in Baltimore of the Association of Colleges and Preparatory Schools of the Middle States and Maryland. The first is to be published in a monograph of the Drexel Institute. The second was published in the Proceedings of the Association for 1917, pp. 60-66.

Mr. Weaver, under the direction of Professor Tilden, has continued the investigation of cement mortars and concretes especially with reference to materials and conditions obtaining in Maryland.

Associate Professor Jones delivered the address at the opening of the Baltimore City Filtration Plant. His subject was "The Relation of Public Water Supplies to the Public Health."

Associate Professor Jones and Mr. Weaver have established a system of sixteen triangulation stations covering the entire University grounds. The stations have been permanently marked and their locations and elevations accurately determined. Engineering work on the grounds and the work of the Summer Course in Surveying will

be based on this system. Other work of this nature, in connection with the establishment of grades and location stations for construction, planting, etc., has been done by the Civil Engineering staff.

Through the efforts of Mr. Bringhurst, moving pictures dealing with engineering problems, have been shown Wednesday afternoons throughout the year.

Professor Tilden attended the Annual Meeting in New York in January of the American Society of Civil Engineers, and Associate Professor Jones and Mr. Weaver attended the Convention of the American Water Works Association in Richmond in May.

ELECTRICAL ENGINEERING

The Laboratory of Electrical Engineering has been open daily throughout the year, and lectures and laboratory work have been conducted as follows:

Advanced Courses

Seminary and Journal Meeting. *One hour weekly through the year.* Professor Whitehead.

Theory of Alternating Current Machinery. *Three hours weekly through the year.* Professor Whitehead.

Advanced Electrical Measurements. *Two hours weekly through the year.* Dr. Kouwenhoven.

Undergraduate Courses

Electrical Engineering 1. Electrical Theory and Direct Current Machinery. *Four hours weekly through the year.* Professor Whitehead and Mr. Pullen.

Electrical Engineering 2. Alternating Current Theory. *Three hours weekly through the year.* Professor Whitehead.

Electrical Engineering 3. Electrical Measurements and Special Topics. *Three hours weekly through the year.* Dr. Kouwenhoven.

Laboratory Work. *Five afternoons weekly through the year.* Professor Whitehead, Dr. Kouwenhoven and Mr. Pullen.

The Seminary and Journal Meeting has met weekly through the year for review of current journals and the presentation of original papers. The following papers were read in the Seminary:

"Correction of the Characteristics of D. C. Generators for Speed Variations." Dr. Kouwenhoven.

"Measurement of Iron Losses at High Frequencies." Dr. Kouwenhoven.

"Characteristics of Water Turbines for Hydro-Electric Plants." Mr. Pullen.

"The Skin Effect." Mr. Pullen.

"The Variation of Ground Conductivity as an Indication of Mineral Deposits." Mr. F. W. Lieberknecht.

"Corona and Sparking in Gases." Mr. F. W. Lieberknecht.

"Measurement of the Crest Value of High Alternating Voltages." Mr. H. B. Brooks.

"History of the Rotary Converter." Mr. H. B. Brooks.

Professor Whitehead, with the assistance of Mr. Pullen, has continued his study of the high voltage corona as a natural standard for measurement. In this work two independent methods of direct measurement of high alternating voltage have been developed. The results promise to establish the law of corona formation more definitely than heretofore, and to define a standard of high voltage of much greater accuracy than any at present available.

Dr. Kouwenhoven has developed experimentally a new method for correcting the characteristic curves of compound generators for errors due to speed variation. The results will be published shortly.

Dr. Kouwenhoven has also completed an important comparative study of several methods of the measurement of iron losses at high alternating frequencies. The results are ready for publication.

Mr. F. W. Lieberknecht is engaged in an experimental study of the electric strength of various gases other than air.

Mr. H. B. Brooks has designed, and is constructing in the shops of the National Bureau of Standards, an absolute electrometer for alternating voltages up to 100,000 volts. The instrument will be used by Mr. Brooks in an experimental investigation looking to a dissertation for the degree of Doctor of Philosophy.

Professor Whitehead delivered a lecture on "The Measurement of High Alternating Voltage" before the Franklin Institute, of Philadelphia, on November 23, 1916.

The following papers have been published during the year:

J. B. Whitehead and W. S. Brown: "The Electric Strength of Air, VII." *Proceedings, American Institute of Electrical Engineers*, February, 1917.

J. B. Whitehead: "The Electric Strength of Air and Methods of Measuring High Voltage." *Journal of the Franklin Institute*, April, 1917.

H. B. Brooks: "A Variable Self and Mutual Inductor." *Bureau of Standards, Scientific Papers*, No. 290, October 12, 1916.

Professor Whitehead has taken an active part in the work of the American Institute of Electrical Engineers, through membership in several of its committees. The Baltimore Section of the Institute, of which Professor Whitehead is Chairman, has held its monthly meetings in the Laboratory.

A number of trips of inspection of electrical engineering plants and projects have been taken by the advanced classes, in charge of members of the faculty, the most noteworthy being visits to the National Bureau of Standards in Washington, and to the Pennsylvania Water & Power Company's plant at Holtwood, Pa.

MECHANICAL ENGINEERING

Advanced Courses

Seminary and Journal Meetings. *One two-hour period per week, second half-year.* Professor Thomas.

Internal Combustion Engines. *Two hours weekly through the year.* Professor Thomas and Associate Professor Christie.

Undergraduate Courses

Mechanical Engineering 1. Thermodynamics of Power Production. *Fours hours weekly through the year.* Professor Thomas.

Mechanical Engineering 2. Design and operation of Power Machinery. *Three hours weekly through the year.* Associate Professor Christie.

Mechanical Engineering 3. Design of Machine Parts and Calculation of Stresses. *Three hours weekly through the year.* Professor Thomas.

Mechanical Engineering 4. Laboratory work. *Two afternoons weekly through the year.* Associate Professor Christie.

Mechanical Engineering 5. Industrial Organization. *One hour weekly through the year.* Associate Professor Christie.

Kinematics of Machinery. *Four hours weekly, second half-year.* Mr. Dana.

The Department of Mechanical Engineering has conducted investigations during the past year as follows:

Two graduate students have made an extended investigation of the conditions inside the smokestack of the University Power Plant, with a view to determining constants needed in the design of smokestacks. They have extended their investigations so as to include some observations on other stacks in Baltimore, and the results of this work have been contributed in the form of an essay for the degree of Master of Arts, by Mr. J. C. Smallwood.

Mr. Smallwood has conducted an investigation of the heat losses occurring in connection with the food preserving industry. This work is to be continued during the present summer and the coming academic year. Active co-operation of firms representing this important industry has been obtained and it is thought that valuable results will come from the investigation.

Professor Christie has continued his work on "Public Utilities" from an engineering standpoint, and has contributed various articles to the technical press.

Professor Thomas has advanced his work on the cooling of water for power-plant purposes and delivered an address upon this subject before the Franklin Institute, in Philadelphia. Professor Thomas has also brought to completion his investigation of a new method for recovering used lubricating oils and has developed a new

method for recovery of gasoline, which has been used in dry cleaning processes. Reports on these lines of investigation will be forthcoming at an early date, and the processes are now being developed for practical application.

The work on the measurement of air, which has been conducted during the past two years, jointly by the United States Navy Department and the Department of Mechanical Engineering, has been advanced during the present year, and apparatus for this work has been moved from the University to Annapolis, where the investigation is being carried on at present.

The equipment for the by-product laboratory has been received at the University and entirely erected, with the exception of the coal distilling retort in the warden's house on the University grounds. It is hoped to begin work in the by-products laboratory during the present summer.

Professors Thomas and Christie attended the Spring Meeting in Cincinnati of the American Society of Mechanical Engineers.

A number of student inspection trips have been conducted by the department during the year, to industrial plants in the vicinity of Baltimore, and reports upon these trips have been made by students.

The department has conducted its usual Seminary during the year, participated in by faculty and graduate students, the subjects treated being "The theory of the internal combustion engine" and "The theory of the steam turbine." The Journal Meeting during the latter half of the year has been participated in by fourth-year students, graduates and faculty, and has confined its attention to the metallurgy of iron and steel.

THE J. E. ALDRED LECTURES ON ENGINEERING PRACTICE

A series of nine lectures on the above subject was delivered by engineers engaged in the practice of the profession. In accordance with the wish of Mr. Aldred, particular stress was laid in arranging these lectures that they should deal with practical phases of engineering problems, rather than with underlying theory, or new and striking applications. The lectures were as follows:

"The Operation of a Hydro-Electric Plant." Mr. A. E. Bauhan, Station Superintendent, Pennsylvania Water & Power Co., Holtwood, Pa.

"Some Things Engineers Should Know Concerning the Rudiments of Corporate Finance." Mr. Ralph D. Mershon, Consulting Engineer, New York.

"The Development of Power from the Standpoint of the Boiler Room." Mr. C. F. Hirschfeld, Chief of Research Dept., Detroit Edison Company, Detroit, Mich.

"Power and Service in Industrial Plants." Mr. R. J. S. Pigott, Superintendent of Motive Power, Remington Arms Company, Bridgeport, Conn.

"Gas Manufacture, Construction and Operation." Mr. George P. Marrow, Assistant Engineer, in charge of Gas Manufacture, Consolidated Gas, Electric Light & Power Company, Baltimore.

"Rapid Transit Problems in American Cities." Mr. George Staples Rice, Engineer of the Sixth Division of the Public Service Commission of New York.

"Some Practical Problems met with in the Design and Construction of Bridges and Similar Structures." Mr. W. W. Pagon, Consulting Engineer, Baltimore.

"Experimental Engineering, particularly the Construction of Testing Stations on Water and Sewerage Problems." Mr. Langdon Pearse, Division Engineer, Sanitary District of Chicago.

"Public Utility Engineering and Finance." Mr. Herbert A. Wagner, President, Consolidated Gas, Electric Light & Power Company, Baltimore.

NIGHT COURSES FOR TECHNICAL WORKERS

A series of evening courses in engineering subjects for technical workers was given during the year for the first time. They have been attended by a large number of students, and the results of this work have shown that a very real demand exists for these courses. The work for next year has been planned so that those who have pursued evening courses during the past year will be able to continue in more advanced courses during the coming year, and at the same time provision has been made for the entering class of new students. A prospectus has been issued, covering the program for the coming year. During the first half of the year 1916-17, the night courses in Engineering were attended by 218 students, and during the second half year by 152 students. Instruction was given in the following subjects:—

Heat Engines
Machine Design
Industrial Organization
Theory of Direct Currents
Theory of Alternating Currents
Mechanics of Structures
Hydraulics
Elementary Mathematics
Elementary Physics
Elementary Chemistry

For the coming year, in addition to the courses just named, instruction will be given in Power Plant Design, Mechanics of Machinery, Structural Design, Water and Sewage Analysis, and an extension of the work in Electrical Engineering, and in Mathematics, Physics and Chemistry.

C. C. THOMAS,
C. J. TILDEN,
J. B. WHITEHEAD, *Secretary*.

SCHOLARSHIPS IN THE DEPARTMENT OF ENGINEERING

Scholarships were held during the year 1916-17 by the following persons:

SCHOLARSHIPS IN THE DEPARTMENT OF ENGINEERING CREATED BY ACT OF LEGISLATURE, 1912

To Graduates of Maryland Colleges

Eugene F. Baldwin (A. B., Loyola College).
 Anthony V. Buchness (A. B., Loyola College).
 J. Wilmerton Darley (A. B., Western Maryland College).
 John L. De Marco (S. B., St. John's College).
 Edgar K. Pfitsch (S. B., Washington College).
 Carl L. Schaeffer (A. B., Western Maryland College).
 William D. Tipton (A. B., Western Maryland College).
 Oliver P. Winslow (S. B., St. John's College).
 A. Roy Woodland (S. B., Washington College).

To Residents of Baltimore City and the Counties

Mark H. Biser, of Frederick County.
 Kenneth O. Bitter, of Baltimore County.
 Charles W. Black, of Baltimore (Fourth District).
 Harry E. Bloomsburg, of Baltimore (Fourth District).
 James M. Bowling, Jr., of Charles County. [Senatorial]
 Daniel B. Bratt, of Talbot County. [Senatorial]
 Guy L. Bryan, Jr., of Dorchester County. [Senatorial]
 Louis L. Cassard, of Baltimore (Third District).
 William D. Cecil, of Queen Anne's County. [Senatorial]
 Charles W. Chesley, of St. Mary's County. [Senatorial]
 Theodore L. Chisholm, of Montgomery County.
 William L. Clark, of Harford County.
 Edwin C. Clayton, of Baltimore (Fourth District).
 Hyman A. Cohen, of Baltimore (Second District).
 John H. Collins, of Kent County. [Senatorial]
 George H. Cronin, of Harford County.
 Edgar S. Daugherty, of Somerset County.
 Francis M. Defandorf, of Montgomery County.
 John L. Defandorf, of Montgomery County. [Senatorial]
 Frank C. Dehler, of Baltimore (Second District).
 Ryland N. Dempster, of Baltimore (Third District).
 Richard S. Dodson, Jr., of Talbot County.
 John J. Downey, of Montgomery County.
 Richard T. Earle, of Prince George's County.
 Harry Ewald, of Allegany County.
 Joseph P. Folkoff, of Baltimore (First District).
 Frank I. Fonaroff, of Baltimore (Fourth District).
 John Hager, of Cecil County. [Senatorial]
 E. Gerry Hall, of Baltimore (Third District).
 Milton L. Hancock, of Worcester County.
 George S. Harris, of Queen Anne's County.
 Louis W. Henck, of Frederick County. [Senatorial]
 Stanley L. Howard, of Baltimore County.
 Jacob S. Jammer, of Allegany County.
 John R. Johnston, of Washington County.
 Lloyd E. Johnston, of Somerset County.
 Albert B. Junkins, of Baltimore (Fourth District). [Senatorial]
 Bernard Kaplan, of Washington County.

Erman R. Kauffman, of Carroll County.
 Jacob F. Kauffman, of Caroline County.
 Lester S. Kauffman, of Caroline County. [Senatorial]
 Clarence E. Keefer, of Baltimore (Third District).
 Joseph L. Krieger, of Baltimore. [At large]
 Jacob Levin, of Baltimore (First District). [Senatorial]
 Morris Levin, of Baltimore (First District).
 Roger E. Martz, of Washington County.
 Louis Meyerhoff, of Baltimore (Second District).
 Daniel T. Ordeman, of Frederick County.
 Noble L. Owings, of Baltimore (Third District). [Senatorial]
 E. Everett Perkins, Jr., of Prince George's County. [Senatorial]
 Abraham Pikoos, of Baltimore (First District).
 George J. Porter, of Wicomico County.
 Henry L. Prince, Jr., of Baltimore County.
 G. W. Harold Reed, of Washington County.
 Milton Reiner, of Baltimore (Second District).
 John D. Roop, Jr., of Carroll County. [Senatorial]
 Jacob S. Rosenthal, of Baltimore. [At large]
 Harry B. Shaw, of Frederick County.
 George B. Shawn, of Caroline County.
 Eli Silberstein, of Baltimore (First District).
 E. Guy Stapleton, of Baltimore County. [Senatorial]
 Bernard A. Sullivan, of Baltimore (Second District). [Senatorial]
 J. T. Thompson, of Baltimore. [At large]
 Walter T. Tibbets, of Howard County. [Senatorial]
 Paul E. Tignor, of Wicomico County. [Senatorial]
 Francis H. Townsend, Jr., of Baltimore. [At large]
 Benjamin T. Truitt, Jr., of Worcester County. [Senatorial]
 J. LeRoy Tull, of Anne Arundel County. [Senatorial]
 John M. Twigg, of Allegany County. [Senatorial]
 Hermann Wacker, Jr., of Baltimore (Fourth District).
 Everett L. Warner, of Baltimore County.
 C. Lester Warnick, of Allegany County.
 John S. Watson, of Charles County.
 Francis P. Weaver, of Baltimore County.
 William D. Webb, of Harford County. [Senatorial]
 Walter E. Weeks, of Baltimore (Third District).
 Joseph Weil, of Baltimore (Second District).
 Carroll E. Williams, of Anne Arundel County.
 George M. Wingard, Jr., of Talbot County.
 Alexander McW. Wolfe, of Baltimore. [At large]
 John W. Young, of Somerset County. [Senatorial]
 Louis McC. Young, of Washington County. [Senatorial]
 Charles T. Zahn, of Carroll County.
 Isadore M. Zeskind, of Baltimore. [At large]
 Louis M. Zeskind, of Baltimore (First District).

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SPECIAL SCHOLARSHIPS IN THE DEPARTMENT OF ENGINEERING
 NOT PROVIDED FOR BY THE LEGISLATURE BUT CREATED
 BY THE TRUSTEES FOR MARYLAND STUDENTS
 ENTERING IN OCTOBER, 1912

R. Wilson Evitt, of Baltimore County.
 E. LeRoy Smith, of Harford County.
 Walter A. Wood, Jr., of Baltimore County.

(3)

REPORT OF THE DIRECTOR OF THE GYMNASIUM

TO THE PRESIDENT OF THE JOHNS HOPKINS UNIVERSITY:

The work of the Gymnasium Department for the year 1916-1917 has undergone a complete transition, owing particularly to two factors,—first the removal to Homewood where we have had no regularly established building for carrying on work in physical education, and the establishment of a course in military training. According to this transition we emphasized the course in military training, endeavoring to get the majority of the students to take that work instead of selecting the ordinary physical training course. As a result we had only thirty-two students in the regular physical training course and this was about the capacity of our equipment. In military training in the beginning of the year we had enrolled one hundred and sixty-nine. Our maximum strength during the year was two hundred and twenty-seven. This was at the time of the declaration of war. The work in military training has been eminently successful, and has done everyone who went into it good, and it is hoped that the same class of work will continue in years to come.

On the athletic side we continued regular work until the first part of April, when all intercollegiate athletics were declared off. However, we have had engaged this year in active intercollegiate sports one hundred and fifty-six students. This does not include those who were engaged in tennis, basketball or intramural sports of any sort. If this number were included we would have about two hundred students engaged in athletic work of some sort. It is our desire to get every man in the college department engaged in some sort of athletic activity and, with that end in view, the Athletic Association has engaged for next year the services of Mr. R. G. Murphy, an A. B. from Pennsylvania and now at Gilman Country School as their head of athletics. He comes to us as an all-time man whose duty it is to look after the coaching end of the work connected with the teams, and to facilitate a thorough organization amongst the students for active participation in sports, and to further the interest in all intramural sport. I think this is the first step that we have taken to really organize intramural sports on any substantial basis, and I think Mr. Murphy is thoroughly capable of taking care of the active work.

The spring athletics, which were abandoned on account of the war, makes the intercollegiate situation for next year a little disorganized, but I believe the consensus of opinion is that athletics in the colleges will resume next fall on a normal basis, and a meeting, to this end, of the National Athletic Association will be called some time during the summer to pass upon a uniformity of activity amongst

all the colleges. So I think our outlook for next year is good for the continuance of intercollegiate sport.

In addition to that, however, it will be our aim to get every man in the undergraduate department interested in some intramural activity, and so gain the benefit thereby so needed amongst our students. With the prospect before us of really starting on a sound basis our work in this department, I hope it will be that definite suitable time will be allowed for such work, and I hope that the eight-thirty hour, or even an eight o'clock hour will be established as the beginning of the day's work and will persist throughout the year.

The military training for next year will not necessarily be so intensive as it was this year and will probably only take the prescribed two sessions a week; thus the organization of the athletic sports amongst the students and the work in the military training can be worked out satisfactorily.

RONALD T. ABERCROMBIE,
Director of the Gymnasium.

REPORT ON INSTRUCTION IN MILITARY SCIENCE AND TACTICS

TO THE PRESIDENT OF THE JOHNS HOPKINS UNIVERSITY:

On the thirty-first of May the military department concluded its year's work with the annual inspection of the battalion by the officer detailed from the War Department for that purpose. The battalion, although badly depleted at that time because of enlistments in the various branches of the military and naval services, presented a creditable appearance and was highly complimented by the inspecting officer for its efficiency and the condition of its equipment.

The department was organized for the first time on October 16, 1916, with a battalion of three companies of infantry. The undersigned was detailed as Professor of Military Science and Tactics, and two enlisted assistants from the regular army were present throughout the school year. These were First Sergeant William Evans, United States Engineers, retired, and Sergeant Albert Friedlander, Infantry, unassigned, formerly 1st Sergeant, Company "B," 36th U. S. Infantry. One hundred and sixty-nine student cadets were enrolled in the Corps at the beginning of the year and the strength of the Corps varied during the year between that figure and two hundred and twenty-seven, its maximum strength. Instruction was afforded in nearly all branches of military science, including infantry drill, ceremonies, guard, tactical exercises, terrain exercises, combat exercises, manual of arms, bayonet exercise, Butt's manual, intrenching, care and nomenclature of the rifle and visual signalling. A number of efficient and able officers were developed and all of these are now in the government military service. Uniforms were obtained by purchase from the Depot Quartermaster, Philadelphia, the khaki service being worn. The university purchased considerable equipment at its own expense, including drums, bugles and other equipment. A handsome silk standard was presented to the battalion by Dr. Ronald T. Abercrombie, the Director of the Gymnasium.

Throughout the entire year a most commendable spirit of loyalty and enthusiasm was displayed by the students who took the course and the whole-hearted support and co-operation of the faculty and university authorities was most gratifying to the instructors in the Department. The impossibility of obtaining complete equipment for the boys made the work less comprehensive than might have been desired. The thanks of the Department are due the Commanding Officer of the Fourth Maryland Infantry for permission to use that organization's armory and rifles during the winter weeks when it was impossible to drill outside and before the rifles for the Corps were furnished.

C. WINSLOW ELLIOTT,

*First Lieutenant, 4th U. S. Infantry, Collegiate Professor of
Military Science and Tactics.*

REPORT OF THE REGISTRAR

TO THE PRESIDENT OF THE UNIVERSITY:

During the year 1916-1917 the academic staff included two hundred and seventy-one teachers, ninety-six in the philosophical and engineering departments and one hundred and seventy-five whose work lay wholly or chiefly in medicine. In addition, there were forty-one instructors—not members of the regular teaching body—in the College Courses for Teachers, the Summer Courses, and the Courses in Business Economics; and there were twenty-eight lecturers, most of them non-resident, who gave single lectures or short courses. The number of students enrolled in the regular courses was ten hundred and thirty-three, of whom five hundred and seventy-seven were residents of Maryland (Baltimore, three hundred and seventy-six), four hundred and thirty-five came here from forty-three other States and Territories of the Union, and twenty from foreign countries. Among the students were six hundred and thirty-seven already graduated, of whom two hundred and forty-nine were enrolled in the department of Philosophy and the Arts (including sixty-three women), three hundred and seventy-one in the department of Medicine (including forty-one women), and seventeen in the department of Engineering.

There were two hundred and nineteen candidates for the degree of Bachelor of Arts, one hundred and sixty-five candidates for the degree of Bachelor of Science in Engineering, and thirteen were enrolled as special students, pursuing courses of study for which they seemed fitted, without reference to graduation. The college courses for teachers were attended by four hundred and thirty-five persons; the summer college and graduate courses of 1916 by five hundred and ninety-five; the summer courses for physicians (1916) by fifty-nine. The evening courses in Business Economics were followed by four hundred and ninety-nine persons and those for technical workers by two hundred and eight, this being the first year of these courses. The enrolment for the year is summarized below:

<i>Faculty</i>	
President and Professors.....	65
Clinical Professors.....	7
Associate Professors.....	39
Associates	84
Instructors and Assistants.....	126
	271
Lecturers for the year.....	28
Additional Instructors in College Courses for Teachers, Summer Courses, and Courses in Business Economics.....	41

Students

I. Graduate Students:		
A. Department of Philosophy:		
1. Fellows by Courtesy.....	28	
2. Fellows:		
University	14	
Adam T. Bruce.....	1	
William S. Rayner.....	1	
Edmund Law Rogers.....	1	
3. Other Graduate Students:		
a. Candidates for higher degrees.....	182	
b. Special Students.....	72	249
B. Department of Medicine:		
1. Candidates for the degree of Doctor of Medicine	858	
2. Physicians attending Special Courses.....	18	871
C. Department of Engineering:		
1. Candidates for a higher degree.....	4	
2. Candidates for the degree of Bachelor of Science in Engineering.....	18	17
II. Undergraduate Students:		
1. Candidates for the degree of Bachelor of Arts...	164	
2. Candidates for the degree of Bachelor of Science in Engineering.....	144	
3. Candidates for Matriculation.....	76	
4. Special Students.....	18	397
Total		1034
III. Attendants on College Courses for Teachers:		
1. Candidates for the degree of Bachelor of Science	89	
2. Candidates for Matriculation.....	11	
3. Special Students.....	385	485
IV. Attendants on Evening Courses:		
1. Business Economics.....	499	
2. Technical Courses.....	208	707
V. Attendants on Summer Courses, 1916:		
1. Courses for Physicians.....	59	
2. Graduate and College Courses.....	595	654
Total receiving instruction.....	2880	
Counted twice.....	163	
Net total.....		2667

During the first forty-one years of the University's existence, eight thousand-six hundred and seventy-two individuals attended the regular courses. Three thousand four hundred and eighty-six were registered as from Maryland (two thousand six hundred and fifty from Baltimore) and five thousand one hundred and eighty-six from eighty-four other states and countries. Five thousand eight hundred and eighty-four persons entered as graduate students and two thousand seven hundred and eighty-eight as undergraduates. Of the undergraduates, seven hundred and twelve have subsequently followed graduate courses here, many of them proceeding to higher degrees. The total number of graduate students enrolled is six thousand five hundred and ninety-six. The following table shows the enrolment by years from the beginning.

	Total *	Graduates	Undergraduates	
			Candidates for Degrees	Special
1876-77	89	54	12	23
1877-78	104	58	24	22
1878-79	123	63	25	25
1879-80	159	79	32	48
1880-81	176	102	37	37
1881-82	175	99	45	31
1882-83	204	125	49	30
1883-84	249	159	53	37
1884-85	290	174	69	47
1885-86	314	184	96	34
1886-87	378	228	108	42
1887-88	420	231 { Phil., 220 Med., 11	127	62
1888-89	394	216 { Phil., 202 Med., 14	129	49
1889-90	404	229 { Phil., 209 Med., 20	130	45
1890-91	468	276 { Phil., 233 Med., 43	141	51
1891-92	547	337 { Phil., 298 Med., 39	140	70
1892-93	551	347 { Phil., 297 Med., 50	133	71
1893-94	522	344 { Phil., 261 Med., 83	123	55
1894-95	589	412 { Phil., 284 Med., 128	126	51
1895-96	596	406 { Phil., 253 Med., 153	149	41
1896-97	520	344 { Phil., 210 Med., 134	144	32
1897-98	641	456 { Phil., 215 Med., 241	152	33
1898-99	649	462 { Phil., 210 Med., 252	163	24
1899-1900	645	469 { Phil., 185 Med., 284	159	17
1900-01	651	473 { Phil., 168 Med., 305	158	20
1901-02	694	530 { Phil., 172 Med., 358	158	6
1902-03	695	532 { Phil., 187 Med., 345	147	16
1903-04	715	556 { Phil., 202 Med., 354	141	18
1904-05	746	563 { Phil., 195 Med., 368	160	23
1905-06	720	530 { Phil., 162 Med., 368	163	27
1906-07	671	504 { Phil., 158 Med., 346	146	21
1907-08	683	518 { Phil., 171 Med., 347	142	23
1908-09	731	562 { Phil., 187 Med., 375	138	31
1909-10	821	595 { Phil., 188 Med., 407	143	14
1910-11	916	625 { Phil., 210 Med., 415	180	10
1911-12	1206	623 { Phil., 217 Med., 406	170	9
1912-13	1090	600 { Phil., 215 Med., 385	192 { A. B., 165 S. B. (E), 27	8

* Including those enumerated in table of College Courses for Teachers, etc., and excluding duplicates.

	Total*	Graduates	Undergraduates	
			Candidates for Degrees	Special
1913-14	1325	607 { Phil., 213 Med., 378 Eng., 16	249 { A. B., 170 S. B. (E), 79	14
1914-15	1413	637 { Phil., 235 Med., 383 Eng., 19	273 { A. B., 169 S. B. (E), 104	16
1915-16	1668	625 { Phil., 226 Med., 380 Eng., 19	308 { A. B., 175 S. B. (E), 128	21
1916-17	2667	637 { Phil., 249 Med., 371 Eng., 17	384 { A. B., 219 S. B. (E), 165	18

The enrolment in the College Courses for Teachers and the other courses established from time to time since 1909 is given below. The figures for the Summer Courses are in each case for the Summer of the year first named.

	College Courses for Teachers	Summer Courses	Business Courses	Night Technical Courses
1909-10	69			
1910-11	101			
1911-12	118	335		
1912-13	119	201		
1913-14	167	347 { Coll., 277 Med., 70		
1914-15	189	356 { Coll., 287 Med., 69		
1915-16	343	487 { Grad., 65 Coll., 363 Med., 59		
1916-17	435	654 { Grad., 110 Coll., 485 Med., 59	499	208

* Including those enumerated in table of College Courses for Teachers, etc., and excluding duplicates.

The enrolment in the medical department, not including the summer courses, has been as follows:

	Candidates for M.D.	Drs. of Med.	Total.		Candidates for M.D.	Drs. of Med.	Total.
1893-94	18	65	83	1905-06	293	75	368
1894-95	51	77	128	1906-07	263	83	346
1895-96	84	69	153	1907-08	277	70	347
1896-97	122	11	134	1908-09	297	78	375
1897-98	167	74	241	1909-10	234	73	407
1898-99	197	55	252	1910-11	251	65	416
1899-1900	211	73	284	1911-12	255	51	406
1900-01	209	96	305	1912-13	251	84	335
1901-02	229	120	358	1913-14	260	18	278
1902-03	256	89	345	1914-15	261	22	283
1903-04	276	78	354	1915-16	258	27	285
1904-05	291	77	368	1916-17	258	18	271

The geographical distribution of the students in the regular courses is shown by the following table:

	From Maryland.	From Other States and Countries.		From Maryland.	From Other States and Countries.
1876-77	59	80	1897-98	279	262
1877-78	71	83	1898-99	277	272
1878-79	76	47	1899-1900	262	233
1879-80	97	62	1900-01	270	281
1880-81	95	81	1901-02	273	421
1881-82	97	78	1902-03	253	412
1882-83	106	98	1903-04	294	421
1883-84	123	126	1904-05	312	434
1884-85	130	160	1905-06	304	416
1885-86	130	184	1906-07	257	414
1886-87	162	216	1907-08	267	416
1887-88	199	221	1908-09	311	420
1888-89	183	211	1909-10	286	466
1889-90	215	189	1910-11	337	478
1890-91	235	223	1911-12	337	465
1891-92	273	274	1912-13	353	442
1892-93	266	285	1913-14	436	420
1893-94	260	262	1914-15	437	439
1894-95	260	229	1915-16	491	458
1895-96	272	224	1916-17	578	455
1896-97	254	266			

The attendance upon the regular graduate and undergraduate courses has been as follows during the last five years:

	1912-13	1913-14	1914-15	1915-16	1916-17
Mathematics	104	174	198	208	240
Physics and Astronomy	132	177	191	170	185
Chemistry	110	130	147	127	156
Geology and Mineralogy	51	57	65	63	53
Zoology, Botany, Plant Physiology	66	83	86	73	89
Greek	41	51	26	30	38
Latin	56	74	55	54	55
Classical Archaeology and Art	24	35	18	20	25
Sanskrit and Comparative Philology	27	26	33	25	22
Semitic Languages	16	22	17	32	34
English	191	251	271	248	299
German	104	116	114	110	117
French, Italian and Spanish	127	149	177	165	207
History	91	85	81	85	105
Political Economy	104	80	104	96	133
Political Science	35	24	31	55	36
Philosophy, Psychology and Education	73	75	...	...	...
Psychology	...	...	17	23	41
Philosophy and Education	...	...	82	...	...
Philosophy	...	...	...	132	130
Education	...	...	...	10	22
Engineering (Civil, Elec. and Mech.)	...	47	78	96	112

The following tables record the enrolment by subjects in the College Courses for Teachers and in the Summer Courses since their initiation:

College Courses for Teachers

	1909- 10	1910- 11	1911- 12	1912- 13	1913- 14	1914- 15	1915- 16	1916- 17
Mathematics	9	15	6	..	6	..	..	6
Chemistry .....	..	10	..	..	6	..	20	10
Biology	1	4	..	..	..	..	..	1
Latin	3	..	6	4	6	..	..	..
Hebrew .....	..	..	..	1	..	..	..	..
English Composition.....	29	28	86	26	27	27	49	44
English Literature.....	16	8	22	32	49	46	50	70
German	4	6	9	23	25	5	22	39
French	2	5	12	17	35	33	33	43
History	7	15	12	4	8	9	10	12
Education .....	..	14	21	21	21	43	78	121
Psychology .....	..	..	..	7	9	11	34	46
Political Economy.....	..	..	..	..	..	16	34	42
Hygiene .....	..	..	..	..	..	7	7	20
Italian .....	..	..	..	..	..	..	11	11
Spanish .....	..	..	..	..	..	..	6	18
Life Insurance.....	..	..	..	..	..	..	42	..
Biblical Archaeology.....	..	..	..	..	..	..	..	3
History of the Ancient East ..	..	..	..	..	..	..	..	7
History of Art.....	..	..	..	..	..	..	..	35
History of Israel.....	..	..	..	..	..	..	..	2
Literature of the Bible.....	..	..	..	..	..	..	..	2
Philosophy .....	..	..	..	..	..	..	..	2
Physics .....	..	..	..	..	..	..	..	1

Summer Courses

	1911	1912	1913	1914	1915	1916	1917
Mathematics	23	8	9	16	19	12	11
Physics	14	11	7	13	27	20	8
Chemistry	25	29	41	28	39	40	27
Biology	59	9	19	18	15	16	30
Latin	22	9	12	9	6	7	14
English Composition.....	121	65	51	68	72	93	40
English Literature.....	48	39	37	49	35	53	32
German	33	24	20	20	46	41	24
French	26	26	15	27	29	27	42
Spanish .....	..	..	..	7	9	20	19
History	56	31	50	43	44	71	40
Education	172	95	148	135	245	387	313
Domestic Science and Art ..	24	15	27	22	31	17	14
Manual Training.....	24	4	19	12	24	31	24
Politics .....	..	..	..	14	16	9	7
Playground and Recreation ..	..	..	..	..	16	14	..
Psychology .....	..	..	..	..	15	57	50
Geography .....	..	..	..	..	..	28	11
Economics .....	..	..	..	..	..	11	23
Penmanship .....	..	..	..	..	..	84	33
Fine Arts.....	..	..	..	..	..	..	34
Philosophy .....	..	..	..	..	..	..	16
Semitic Languages.....	..	..	..	..	..	..	17

Degrees were conferred during the year upon two hundred and thirty-three candidates—Bachelor of Arts, forty-four; Bachelor of Science in Engineering, thirty-seven; Bachelor of Science, three; Master of Arts, thirteen; Doctor of Philosophy, forty-four; Doctor of Medicine, ninety-two. Since degrees were first conferred, in 1878,

thirteen hundred and twenty-seven persons have attained the degree of Bachelor of Arts; fifty-two, the degree of Bachelor of Science in Engineering; six (including five women), the degree of Bachelor of Science; eighty-five (including twenty-four women), the degree of Master of Arts; ten hundred and seventy (including twenty-seven women), the degree of Doctor of Philosophy; and thirteen hundred and seventeen (including one hundred and nineteen women), the degree of Doctor of Medicine. The total number of individuals graduated is thirty-four hundred and ninety-eight. Certificates of proficiency in applied electricity were awarded to ninety-one persons from 1889 to 1899.

Summary of Degrees Conferred

A. B. Ph. D. M. D.					A. B. Ph. D. M. D. A. M. B. S. B. S.								
					(E.)								
1877-78	4	..	1897-98	.	49	36	22	..	..	..
1878-79	.	8	.	6	..	1898-99	.	38	42	33	..	..	..
1879-80	.	16	.	5	..	1899-1900	.	46	35	43	..	..	..
1880-81	.	12	.	9	..	1900-01	.	42	30	53	..	..	..
1881-82	.	15	.	9	..	1901-02	.	47	17	57	..	..	..
1882-83	.	10	.	6	..	1902-03	.	46	27	49	..	..	..
1883-84	.	23	.	15	..	1903-04	.	37	31	45	..	..	..
1884-85	.	9	.	13	..	1904-05	.	32	35	54	..	..	..
1885-86	.	81	.	17	..	1905-06	.	48	32	85	..	..	..
1886-87	.	24	.	20	..	1906-07	.	47	35	78	..	..	..
1887-88	.	54	.	27	..	1907-08	.	47	28	63	..	..	..
1888-89	.	36	.	20	..	1908-09	.	37	27	53	4	..	..
1889-90	.	27	.	33	..	1909-10	.	14	25	69	3	..	..
1890-91	.	51	.	28	..	1910-11	.	31	28	85	11	..	..
1891-92	.	41	.	37	..	1911-12	.	37	32	85	5	..	..
1892-93	.	40	.	28	..	1912-13	.	36	32	76	11	..	..
1893-94	.	41	.	34	..	1913-14	.	52	30	91	13	..	..
1894-95	.	37	.	47	..	1914-15	.	35	31	89	12	3	..
1895-96	.	37	.	36	..	1915-16	.	27	37	82	13	12	3
1896-97	.	36	.	42	15	1916-17	.	44	44	92	13	27	3
					<hr/>								
					1827 1070 1817					85 52 6			

REPORT OF THE LIBRARIAN

TO THE PRESIDENT OF THE UNIVERSITY:

Herewith is submitted my ninth annual report on the library, covering the year ending June 30, 1917.

We have now been one season in Gilman Hall, and it is not too much to say that the arrangement of this unique building—the first apartment house among the libraries of the world—has been keenly appreciated by those who have lived there, as well as by the numerous visiting professors and architects.

Nor are there signs of misery in the branch libraries of the scientific departments in their temporary housings at Homewood. The Biological Library, unified once more and fireproof, is certainly better off in the basement of Gilman Hall than it was on Eutaw Street, where it battled with dirt and climbed crowdedly to twelve-foot ceilings.

A very pleasing room, with abundant northern light, has proved to be the one found for Physics and Astronomy in the Mechanical and Electrical Engineering building, and the reunion there, on the fine old oak shelving of McCoy Hall, of all our books in these subjects, has been a matter of pride and convenience to the department.

Professor Mathews' happy solution of the shelving problem for Geology (and Civil Engineering) in the building of the latter has served to bring together in one room out of the old pigeonholes this really splendid collection of material which all the members of that staff take such interest in fostering.

And finally, the Medical School Library is free of the danger of destruction by fire always so feared, and in its new quarters in the Hunterian Laboratory an arrangement has been worked out that seems to give much satisfaction to its busy users.

So that 1916 in the annals of the library will always be clearly perceived by students of its history to begin the Fourth Series of its course—and happily,—the Second being marked by the entrance into McCoy Hall in 1894, and the Third by the fire of 1908.

ACCESSIONS

But the next chapter is war. War sent men from their beneficent tasks to thoughts of destruction, curtailing production in fields which universities are wont to till, and checking distribution of what did reach fruition. Consequently our accessions, whether by purchase, gift, or exchange, fell below normal this year.

Irrespective of binding, we received of books and pamphlets, by purchase 2,556 volumes; by gift, 4,623 v.; by exchange, 2,511 v.;

U. S. deposit, 147 v.; Maryland Geological Survey deposit, 24 v.; J. H. U. manuscript dissertations, 95 (the file of two years); 2 copies each of 30 J. H. U. printed dissertations; 11 other J. H. U. publications. Total, 10,027 pieces. In addition we received 113 maps, 11 manuscripts, 1 chart, and 223 odd numbers of periodicals. Of these receipts 5,977 were bound. As, however, 594 volumes were disposed of, the net bound accessions amounted to 5,383 volumes. The present accession number of bound volumes in the library is 202,247.

Compare these figures with the annual averages for the three years immediately preceding the war, 1911-12—1913-14: Pieces purchased, 5,674; pieces given, 5,458; pieces received by exchange, 9,047; these, with other classes, making an average annual total of 20,759 pieces; and of bound accessions, 8,500 volumes.

The mortality in learned serials is particularly distressing, and, what practically amounts to the same thing so far as American scientists and scholars are concerned, the paralysis of the international exchange system and of transportation in general has served to break the current of thought between the United States and continental Europe.

After the proclamation of blockade in March, 1915, the British authorities arranged for the importation of certain classes of enemy publications, and in the autumn the scheme was extended to include universities, colleges, and public bodies of the United States, the Librarian of Congress serving as intermediary. But difficulties soon developed, and by the spring of 1916 shipments to America ceased altogether—a condition that still obtains. Under these circumstances a special committee of the American Library Association was formed toward the close of 1916 to deal with the problem. Of this committee the Librarian of this University served as Secretary, and conducted the negotiations through the Department of State with the Foreign Office. Following eighteen months of unremitting labor on the part of Dr. Herbert Putnam, Librarian of Congress, and aided by him still at every turn, even to the extent of dispatching a member of his staff to London for a residence of six months, the Secretary found valued allies in an old comrade of us all, who never quite forgets us, Sir William Osler, and in Mr. J. Y. W. MacAlister, President of the (British) Library Association and Secretary of the British Society of Medicine. The result is that in June, 1917, Mr. Balfour terminated the existing arrangement and ordered the release of shipments detained at Rotterdam, if destined for public institutions of the United States. As soon, therefore, as transportation facilities are available, we may expect to receive these accumulations so far as they had left Germany. How much remains stored there and what her attitude toward exportation will be, now that we are a belligerent, are unknown. But when the "Trading-with-the-Enemy Act" is disposed of by Congress, we expect to test the case.

Even with neutrals and countries in possession of active shipping, exchange relations have greatly slackened, because of the submarine menace and the consequent necessity of devoting tonnage to primary supplies.

LIBRARY OF HYGIENE

With the founding of the School of Hygiene and Public Health, active preparations were begun this year for gathering a library in this field, for which \$2,500 a year has been set aside. Among the first provisions of this budget was one for bibliographical aid. Accordingly, by courtesy of the Surgeon-General's Office, accommodation in that library was given for over a month to an assistant preparing typewritten lists of books in hygiene and a long line of related topics, largely suggested by Dr. F. H. Garrison (A. B. 1890), who is now attached to the Surgeon-General's Library as Assistant Librarian, and the editor of its great Index-catalog, as well as of *Index medicus*.

The first acquisition, however, was a nearly complete set of the Reports of the Medical Officer of the Local Government Board of Great Britain in 35 volumes, presented through Dr. W. H. Welch by the Board.

This library will be installed in the new home of the School and will have an attendant in charge at the very outset, and a local catalog made, of course, at Homewood and duplicated for the general catalog in Gilman Hall as well as for insertion in that of the Medical School.

PURCHASES

First mention under this heading is due the *Bibliothèque de l'Ecole des Chartes*, of which we secured a complete set in 77 volumes, from 1839 to 1916.

We succeeded at last in completing the Medical School set of *Jahresbericht über die fortschritte der tierchemie*, of which the first volumes have heretofore been lacking.

Sets of the *Arden* and *First Folio Shakespeares*, *Lope de Vega*, and the *Warner* library of the world's best literature (with a full set of A. L. A. analyticals) were other acquisitions.

A most interesting accession was a collection, in four volumes, of 32 tracts by *Nassau William Senior*, which came from the library of *Sylvian Van de Weyer*. These form worthy additions to the *Hutzler* Collection of economic classics.

GIFTS

There were a number of interesting gifts made this year.

By the terms of his will, the library of *Joseph Henry Hewitt* (M. D. 1906) came to the University in honor of Dr. W. H. Welch. It numbered 841 volumes and 60 numbers of periodicals. In it are found bound files, quite or nearly complete, of several journals, chiefly in pathology, including: *American journal of diseases of children*, v. 1-7, 1911-1914; *American journal of medical sciences*, old series, v. 1-26; new series, v. 1-133, 1907; *American medical association, Journal*, v. 1-162, 1883-1914; *Archives of internal medicine*, v. 1-13; *Beiträge zur pathologischen anatomie und allgemeinen pathologie*,

v. 1-49; *Journal of experimental medicine*, v. 1-19, 1896-1914; *Journal of medical research*, new series, v. 1-24, 1901-1914; *Journal of pathology and bacteriology*, v. 1-17; *Virchow's archiv*, v. 11, 15-182, 201-220. With this library came a fund of \$5,149.00, from the income of which the collection is to be maintained. The northeast corner room on the second floor of the pathological building has been fitted up to receive it and a local catalog installed—all under custody.

The library of another graduate of the Medical School came to us this year—that of Miss Alma Emerson Beall (M. D. 1900). Including some volumes from her father's collections, it numbered 189 volumes and 13 numbers of periodicals.

Professor Fonger DeHaan (Ph. D. 1895) performed a graceful act when he acquired the library of the late Professor J. E. Matzke (Ph. D. 1888) and turned it over to the possession of their common Alma Mater and the memory of the loved master. Such volumes as we could use to advantage were to be added to our shelves. These amounted to 156 volumes, mainly in the Romance languages and literatures. The remainder, including several valuable sets of periodicals, should be sold, and the proceeds added to the publication fund of the A. Marshall Elliott Monographs. Thus once more is demonstrated the priceless value to the University of the Elliott tradition, for his men were linked to him and to each other with hooks of steel. There is no field of human endeavor where the kindly heart does not outlast severity and calculation.

Another graduate from the Romance department, Samuel Garner (Ph. D. 1881), presented 112 volumes from his library—mostly in French literature and philology.

The Professor Frank Jewett Mather, Jr. (Ph. D. 1892) gift of \$2,000.00, the income to be used in the purchase of books for the Latin department, brings to mind once more the tragic death of his comrade and former devoted teacher in the University, Morris Crater Sutphen (Ph. D. 1899), in whose memory the gift is made. This enables us to make permanent the provisions begun with former gifts from Professor Mather to the same end.

Professor Gildersleeve, though employing a home office in the conduct of his work since his retirement from active professorship, very generously had most of his classical library sent to Homewood for installation and use in the offices of the department. Furthermore, he is having the shelves examined and volumes added to the University library where these seem calculated to do the greatest amount of good now. One hundred and sixty-three volumes came thus into our possession this year.

Dr. Henry J. Berkley presented a list of texts which will prove welcome additions to our collection of medical classics. The titles should be given in detail:

Aurelianus, C. *Caeli Aureliani Siccensis Afri Aucutorum morborum libri III. Chronicum libri V* ed. . . A. v. Haller. . . 1774. 2 v. in 1.

[Baglivus, C. . . . *De praxi medica adnexis operibus quatuor minoribus Joannis Dominici Santorini*].

- Boerhaavius, H. . . . Praelectiones academicae. . . 1740-1744. 7 v.
 Celsius, A. C. . . . De re medicina libri octe. . . 1748.
 Celsius, A. C. . . . De re medica libri octo. . . 1823.
 Cheselden, W. The anatomy of the human body. . . 1741.
 Culpepper, N. The English physician enlarged. . . 1725.
 Ettmüller, D. M. . . . Kurzer begriff der ganzen artznen-kunst. . . 1717.
 Ganivetius, J. Ioannis Ganiveti Amicus medicorum. . . 1714.
 Hippocrates. Hippocratis aphorismi graeco-latini e regione ex optima versione cum indice nouo. . . 1631.
 Hippocrates. Hippocratis Coi Aphorismi graecè, & latinè. . . 1627.
 Hippocrates. Hippocratis magni Coacae praenotiones. . . 1665.
 Kerckring, T. . . . Spicilegium anatomicum. . . 1670. *Bound with this his Anthropogeniae ichnographia.* . . 1671. 2 v. in 1.
 Mayer, J. C. A. Anatomisch-physiologische abhandlung vom gehirn, rückenmark, und ursprung der nerven. . . 1779.
 Morgagni, G. B. De sedibus et causis morborum per anatomen indagatis libri quinque. . . 1827-1829. 6 v.
 Primerose, J. . . . De vulgi erroribus in medicina, libri IV. . . 1664. *Bound with this: Jonston, J. . . . Thaumatographia naturalis.* . . 1632. 2 v. in 1.
 Swieten, K. van. . . . Commentaria in Hermannii Boerhaave aphorismos. . . 1754-1775. 6 v.
 Sydenham, T. . . . Opera universa. . . 1726.

These were accompanied by a copy of Belidor, B. F. de. La science des ingénieurs dans la conduite des travaux de fortification et d'architecture civile. . . . 1775.

Additions were made to the Textbook library in education by Little, Brown & Co. and Silver, Burdett & Co., who sent 16 and 49 volumes respectively.

The war, of course, brings a steady stream of minor writings of propagandist character; W. M. Dixon, with 34 gifts, and Sir Gilbert Parker, with 177, were the largest contributors.

Among other donors were the following:

E. A. Andrews, 13 biological publications; E. C. Armstrong, 31 French texts and grammars; F. J. Goodnow, 192 miscellaneous volumes, together with 43 odd numbers and reprints; Henry Holt & Co., 44 of their recent issues; John Howland, Index medicus, 2. ser. vols. 5-13 (1907-1915), American journal of medical sciences, n. s. vols. 127-151 (1904-1916), and six other volumes; Ira Remsen, 114 miscellaneous volumes; K. F. Smith, 27 volumes, including Lachmann's Propertius and Tibullus, published each in 1829.

ANALYSIS OF EXPENDITURES

I. *Philosophical, Collegiate and Engineering Departments*

Salaries		\$18,880.50
Books	\$3,795.67	
Periodicals	2,298.08	
Binding	4,904.06	
Maps	81.00	
Library of Congress cards.....	800.00	
A. L. A. cards.....	18.48	
Library Bureau cards.....	180.00	
Card cabinets.....	131.86	
Book supports.....	883.00	
Vacuum cleaner.....	125.00	
Book truck.....	85.00	
Printing and supplies.....	268.29	
Postage and transportation.....	284.28	
Miscellaneous	232.20	
	<hr/>	13,081.87
		<hr/> \$26,961.87

II. *Medical School*

Salary		\$600.00
Books	\$289.99	
Periodicals	727.21	
Binding	803.40	
Concillum Bibliographicum cards.....	4.50	
Linoleum	112.05	
Chairs	86.40	
Miscellaneous	69.11	
	<hr/>	\$2,042.66
		<hr/> \$2,642.66

III. *School of Hygiene and Public Health*

Salary		\$198.00
Books	\$6.50	
Periodicals	6.50	
Binding	34.80	
Miscellaneous	12.75	
	<hr/>	60.55
		<hr/> \$258.55

CATALOGING AND CLASSIFICATION

With the removal to Homewood, and temporary helpers all gone, the Cataloging Department has this year for the first time in its existence gotten down practically to the basis upon which it is hereafter to live.

For a long while to come there will be stray volumes in relatively unimportant subjects coming up for recataloging, especially collections of pamphlets, specifically omitted in the estimate of 1910.

Thus during the year, the Chief Cataloger, feeding the multigraph directly, cleared off a large accumulation of geological pamphlets, the Stokes collection in physics, twenty-four volumes of history pamphlets, nine of medical reprints, nine of Hewitt reprints, and finished the revision and subject heading of about 2,000 main entry cards for pamphlet collections in the Classical section.

Classification is not done, because the schedules are not all in print yet. Thus, we are yet to handle Church history, Classics and Archeology, the Oriental, Spanish, Portuguese, Dutch, and Scandinavian languages and literatures, as well as Italian and American

literatures (not the languages). But as fast as the tables are ready in Washington, this side of the work will be cared for by the Assistant Librarian, Mr. J. Mattern. Thus, he has this year brought nearly to completion the classification of English language and literature.

In the new organization, the current classification falls to the Chief Cataloger, Mr. W. B. Schulz, who also at the same time assigns subject headings. The assumption of this new duty patently shortens the time spent on the two processes assigned him, for one examination of the book brings decision to both questions, but, while freeing Mr. Mattern for other pressing duties, it serves to lower the cataloging output of Mr. Schulz.

Finally, the help of the Librarian's Secretary, Miss Ethel Hubbard, in shelf-listing such volumes as, coming to her in the conduct of the Order Department, required no other cataloging record, had to be withdrawn because of the growing pressure of her regular duties. So again the catalogers suffered loss, and not a mean one, as is shown by the fact that this contribution in 1915-16 amounted to 1,414 volumes.

I have spread these two facts out on the record because they are symptomatic of what is happening in a library staff all the time. Those two decisions represent two front line trenches lost and in the end mean defeat unless reinforcement comes, for the enemy grows steadily in strength. It is not too much to expect at this late date that whenever a new department is added or new book resources uncovered, the Trustees shall automatically reflect that this means increase of the library staff's burden and the obligation arises correspondingly to enlarge its resources. More orders are to be made and records of them kept, more gifts to be recorded and acknowledged, more volumes to be catalogued and classified—processes which increase in nicety of adjustment and consequent difficulty and tedium as the library grows,—more borrowers to accommodate, with less time, therefore, available for keeping the shelves in order, more binding to be got out and repairs to be made, more periodicals to be entered daily, more correspondence, more relations to be fostered. And, unhappy to say, relief in hardly one of these categories is afforded by the appointment of a new custodian where a branch library is established. For reasons of economy and efficiency processes are centralized as far as possible. The chief burden is on central, but it is more difficult for the outsider to realize the strain here and relieve it promptly than to perceive and mechanically meet the need at an outlying point, just as it is easier to get money for a dormitory than to lift a deficit.

Now here is a striking fact. In the eight years that have elapsed since my first full year's budget went into effect, normal annual accessions and book funds have shown an advance of 50%, but the number of the staff remains the same, though the Assistant Librarianship then vacant is now filled, and an appointment for Hygiene is made toward the close of the session. If necessity is the mother of invention, she has a vigorous brood to show for those years.

Witness the Cataloging department. At the opening of the present fiscal year it had a budget actually \$90.00 less than it had September

1, 1909, and yet each of the present members has had increase of salary, the average percentage being 36.

In this division there have been in reality but two to catalog. There is another to run in the headings and a fourth to multiply the cards, while the Chief classifies and assigns subjects. Yet his report shows nearly 12,000 volumes handled and over 45,000 cards prepared and sent 6,004 volumes (cf. 3,738 volumes, the yearly fact that a good percentage of this work has to be duplicated and in four cases triplicated, since sixteen departmental catalogs are maintained in addition to one complete one.

The following table shows the record in detail:

Cards:

Main entries.....	7,791
Duplicate main entries.....	9,676
Added entries.....	14,349
Duplicate added entries.....	8,687
Shelf list cards.....	2,823
Accession cards.....	442
Source cards.....	884
Cross references.....	571
	<hr/>
	45,223

Volumes	11,949
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Of the titles handled cards were secured from the Library of Congress for 48.6%, from Berlin 2%, while the record of the remaining 49.4% was prepared by us—multigraphed (11%), or typewritten (38.4%). As last year, the normal proportions are again upset by the non-arrival of the Berlin cards and most of the material covered by them. Of the 45,223 cards prepared, 21,854 (or 48%) were printed by the Library of Congress, 434 (or 1%) by the Royal Library of Berlin, 16,426 (or 36%) on our multigraph, and the remaining 6,509 (or 15%) were typewritten. In the Reading Room catalog, which aims to be complete for the University, 23,369 cards were filed by the custodians. The total now is 425,150 cards. In the Library of Congress depository catalog 32,860 cards representing new entries were filed. For incorporation in the union catalog of American libraries maintained in Washington by the Library of Congress, we selected 1,625 of our current titles, and sent two cards for each.

Another contribution in national coöperation was made. The Bibliographical Society of America has undertaken to publish a Census of Incunabula owned in the United States and Canada. Mr. Mattern prepared the difficult text for the forty-six titles discovered to be in our possession, and added three found in the Johns Hopkins Hospital Library.

Mr. Schulz supplied the classification for 1,143 titles in addition to those accepted from the Library of Congress.

BINDING

Reduction of purchase this year provided the opportunity to overhaul the shelves and put the library into good repair. All departments were gone over systematically, with the result that our binding bill was \$5,742.26, as against \$3,828.62, the annual average

for the preceding five years. Of this sum, \$5,582.15 was incurred with local bookbinders, to whom Mr. Munzner reports having prepared and sent 6,004 volumes (cf. 3,738 volumes, the yearly average for the preceding five years). Of this number, 3,705 were rebindings. As a matter of fact, 311 other volumes were sent to the binders, but had not been returned when the fiscal year closed.

The story is made clear by a display of percentages. In the preceding five years the average annual expenditures on the three items, "books," "periodicals," and "binding," have stood in the following ratios: 39%, 36½%, 24½%. The corresponding ratios for the year 1916-17 were 31½%, 23½%, 45%. In other words, the binding nearly doubled, and, as might be expected, the drop in periodicals was greater than in books.

The custom, now almost unbroken here, of binding pamphlets into monographic series was extended to zoology, where 70 volumes were made up, very large subject groupings being used so as to clear up all accumulations each year after withdrawal of reprints from journals which come to the Library.

VACUUM CLEANING

In the new buildings surrounded by woods and lawns and freed from the dirt of streets and furnaces, we could at last entertain the hope of obtaining some approach to the virtue next to godliness. A new vacuum cleaner was installed and men set going over the shelves for months. This will be an annual event now, and perhaps at length we can extract the in-grindings of years and avoid the necessity of soap and water after the handling of books.

INTER-LIBRARY LOANS

In the operation of the inter-library loan system we borrowed 242 volumes from 19 institutions and lent 140 volumes to 34 institutions.

M. L. RANEY,
Librarian.

REPORT OF THE JOHNS HOPKINS PRESS

(ABSTRACT)

TO THE PRESIDENT OF THE UNIVERSITY:

I submit herewith the report of the Johns Hopkins Press for the past year.

American Journal of Insanity. This journal is the official organ of the American Medico-Psychological Association. Its editorial control is in the hands of a committee of the Association, consisting of Doctors Henry M. Hurd and E. N. Brush, of Baltimore; G. Alder Blumer, of Providence, R. I.; J. Montgomery Mosher, of Albany, N. Y.; and Charles K. Clarke, of Toronto, Ont. Volume LXXIII (four numbers) was issued. The volume contains 796 pages, 8vo.

American Journal of Mathematics, edited by Professor Frank Morley with the co-operation of Professors A. Cohen, Charlotte A. Scott and other mathematicians. Numbers 3 and 4 (230 pages, completing volume XXXVIII (450 pages quarto) and two numbers of volume XXXIX (220 pages) have been issued.

American Journal of Philology, edited by Professors Basil L. Gildersleeve and C. W. E. Miller. Numbers 3 and 4 (270 pages) completing volume XXXVII (524 pages, 8vo.) and two numbers (236 pages) of volume XXXVIII have appeared.

Beiträge zur Assyriologie und semitische Sprachwissenschaft, edited by Professor Haupt. No part was received during the year.

Hesperia: Schriften zur germanischen Philologie, edited by Professors Collitz and Wood, and *Schriften zur englischen Philologie*, edited by Professor Bright. A fourth number of the English section, entitled Tennyson's Use of the Bible, by Miss Edna Moore Robinson, was published during the year.

Johns Hopkins Hospital Publications. We have continued the publication, on behalf of the Johns Hopkins Hospital, of the *Bulletin*, appearing monthly, and of the *Reports*, of irregular issue.

Of the *Bulletin* six numbers (280 pages) completing volume XXVII (372 pages, 8vo.) and six numbers (216 pages) of volume XXVIII have been issued.

Of the *Reports* volume XVIII, No. 1 (161 pages, quarto, and 3 charts) appeared in July.

The Johns Hopkins University Circular, including the Annual Report of the President, University Register, Medical Department Catalogue, etc., T. R. Ball, Editor. Four numbers (656 pages) completing volume XXXV (1,318 pages, 8vo.) and five numbers (406 pages) of volume XXXVI have been issued. These have included Conferring of Degrees, 1916, The Johns Hopkins Philological Association, 1916-1916, Directory of Summer Courses, 1916, issued in July;

Catalogue and Announcement for 1916-1917 of the Medical Department, issued in October; University Register, 1916-1917, Preliminary Issue, issued in November; The University in its New Home (illustrated), issued in December; Report of the President, 1915-1916, issued in January; Commemoration Day, 1917, issued in February; Contributions to Geology and Plant Physiology, issued in March; Summer Courses June 26-August 7, 1917, issued in April and University Register, 1916-1917, issued in May.

The Johns Hopkins University Studies in Historical and Political Science. The Studies are issued under the direction of the departments of history, political economy and political science. One number (160 pages) completing Series XXXIV (630 pages octavo) and two numbers (436 pages) of Series XXXV have been published. These have included "State Administration in Maryland" by John L. Donaldson; "The Virginia Committee System and the American Revolution," by J. M. Leake; and "The Organizability of Labor," by W. O. Weyforth.

Modern Language Notes. This journal is edited by Professors James Wilson Bright (Editor-in-Chief), Murray Peabody Brush, William Kurrelmeyer, and James Eustace Shaw, and Dr. G. Gruenbaum. Two numbers (146 pages, plus xii pages of bibliography) completing volume XXXI (530 pages, plus xlviii pages of bibliography, octavo) and six numbers (384 pages, plus xxiv pages of bibliography) have been issued.

Elliott Monographs in Romance Languages and Literatures, edited by Professor E. C. Armstrong. We have not been able to issue any numbers during the past year.

Reprint of Economic Tracts, edited by Professor J. H. Hollander. No part appeared during the year.

Terrestrial Magnetism and Atmospheric Electricity, edited by Dr. Bauer. Numbers 3 and 4 (108 pages) completing volume XXI (216 pages, 8vo.) and two numbers (96 pages) of volume XXII were issued.

There were published in September and November volumes 2 and 3 of the *Institutional Care of the Insane in the United States and Canada*. This work was undertaken by us for the American Medico-Psychological Association. The volumes contain 904 and 888 pages, respectively, with numerous illustrations. Volume 4 will complete the set and is announced for early publication.

A new edition of *An Outline of Psychobiology* by Professor Knight Dunlap was published in April. This book has had a most gratifying reception, not only from psychologists but also from biologists, and has proved an exceptionally useful text and reference book for students of psychology and education and even for students of biology. This edition has a complete glossary.

Two additional volumes of the *Albert Shaw Lectures in Diplomatic History* will appear shortly under the following titles: "The Early Diplomatic Relations between the U. S. and Japan, 1853-1865," by Payson J. Treat; and "West Florida, 1798-1813: A Study in American Frontier Diplomacy," by Isaac Joslin Cox.

We are now putting through press for the Department of Engineering the *J. E. Aldred Lectures on Engineering Practice*. This volume will contain the nine lectures which were delivered at the University during March and April, 1917.

The *New Book Department* received during the year 7,413 volumes, including 521 sent on inspection. Of these 6,862 were purchased by members of the University, 187 by the library, and 364 were returned to the publishers.

Consignments of books on inspection were sent through the courtesy of Messrs. G. E. Stechert & Co., the Macmillan Company and Messrs. Longmans, Green & Co., all of New York.

DISSERTATIONS PUBLISHED DURING THE YEAR

Following is a list of dissertations for the degree of Doctor of Philosophy published during the year, of which the required number of one hundred and fifty copies have been received by the University:

Blocher, John Milton, Jr.: *Osmotic Pressure Measurements of Levulose Solutions at Thirty Degrees.*

Brown, William S.: *The Electric Strength of Air at Atmospheric Pressure under Alternating and Continuous Potentials.*

Churchill, E. P., Jr.: *The Absorption of Nutriment from Solution by Fresh Water Mussels.*

Clarke, W. F.: I. *A Study of the Hydrogen Electrode, of the Calomel Electrode, and of Contact Potential.* II. *A Study of the Ethylene Electrode.* III. *Studies in Oxidation and Reduction.*

Donaldson, J. L.: *State Administration in Maryland.*

Edwards, John Bowen: *The Demesman in Attic Life.*

Emmet, Boris: *Profit-Sharing in the United States.*

Gossard, Harry Clinton: *On a Special Elliptic Ruled Surface of the Ninth Order.*

Janes, George Milton: *The Control of Strikes in American Trade Unions.*

Kimball, John Willard: *The Esterification of Benzoic Acid by Isomeric Butyl Mercaptans.*

Leake, James Miller: *The Virginia Committee System and the American Revolution.*

Little, Homer Payson: *The Geology and Mineral Resources of Anne Arundel County.*

McCall, Arthur C.: *The Physiological Balance of Nutrient Solutions for Plants in Sand Cultures.*

McLean, Forman T.: *A Preliminary Study of Climatic Conditions in Maryland, as Related to Plant Growth.*

Markel, Paul D.: *The Transposition of Esters and the Interdependence of Limits.*

Meredith, Clement Orestes: The *Partes Orationis* as Discussed by Virgilius Maro Grammaticus, with some Observations upon his Inflection and Syntax.

Miller, Bessie Irving: A New Canonical Form of the Elliptic Integral.

Moseley, Thomas Addis Emmet: The "Lady" in Comparisons from the Poetry of the "Dolce Stil Nuovo."

Murnaghan, Francis D.: The Lines of Electric Force Due to a Moving Electron.

Myrick, Raymond Thompson: A Study of the Osmotic Pressures of Concentrated Solutions of Sucrose with a Resistance Pressure Gauge.

Ordeman, G. Fred: A Study of the Dissociating Powers of Free and of Combined Water.

Overbeck, Robert M.: The Copper Ores of Maryland.

Pardee, Arthur McCay: A Study of the Conductivity of Certain Organic Salts in Absolute Ethyl Alcohol at 15°, 25°, and 35°.

Robinson, Edna Moore: Tennyson's Use of the Bible.

Sachs, John Harrison: The Esterification of Ortho, Meta and Para Toluic Acids with Ethyl Mercaptan.

Sousley, C. P.: Invariants and Covariants of the Cremona Cubic Surface.

Van Epps, George Dudley: I. Preparation of Nitriles. II. Catalytic Preparation of Nitriles.

Weyforth, William O.: The Organizability of Labor.

Wroth, Benjamin Blackiston: A Study of the Solubilities of Liquids in Liquids. The Partition of the Lower Alcohols between Water and Cottonseed Oil.

Young, Mabel M.: Dupin's Cyclide as a Self-Dual Surface.

C. W. DITTRUS,

Secretary, The Johns Hopkins Press.

REPORT OF THE OFFICIAL STATE BUREAUS CONNECTED WITH THE UNIVERSITY

TO THE PRESIDENT OF THE UNIVERSITY:

I submit herewith a report of the official State Bureaus connected with the University and conducted in co-operation with the Geological Department.

THE MARYLAND GEOLOGICAL SURVEY

The Maryland Geological Survey has now been in existence for twenty-one years, having been established by an Act of the General Assembly in March, 1896. The work has been in charge of Professor Clark as State Geologist from the beginning. The appropriation during the first two years amounted to \$10,000 annually. In 1898 a second Act was passed providing \$5,000 additional to be used chiefly in the preparation of a base map of the State. These appropriations remained in effect until the end of the fiscal year September 30, 1916, when an Act of the Legislature abolished all continuing appropriations. For the two fiscal years ending September 30, 1918, the Survey was allotted \$14,000 annually.

The Survey devotes its activities chiefly to geological studies and to the preparation of topographic maps of the State, although consideration is also given independently or in co-operation with other bureaus, both Federal and State, to the study of problems connected with the terrestrial magnetism, hydrography, agricultural soils, and forestry of the State.

The Survey maintained for twelve years, from 1898 to 1910, a Highway Division. During the earlier years of this period the work was largely advisory. A testing laboratory was established and plans and specifications for road and street improvement by the state, county, and municipal authorities were prepared. In 1904 an Act was passed providing for the construction of State Aid roads, \$200,000 annually being appropriated by the State, to be met by an equal amount from the counties, the work to be done under the plans, specifications, and supervision of the State Geological Survey. In 1906, 1908, and 1910, \$384,000 in all were appropriated for the construction, under the auspices of the Geological Survey, of a modern highway from Baltimore to Washington. Altogether over \$1,500,000 were appropriated by the State and counties to be spent under the auspices of the Survey, and over 150 miles of modern roadway were constructed. During this period the various deposits available for road construction throughout the State were tested, as well as the various materials employed on the streets of most of the cities and towns of the State. Much advice in the matter of road and street construction was given to the public officials. In 1910 the highway work of the Survey was transferred to the State Roads Commission, which had been organized in 1908, and

of which President Remsen and Professor Clark were members until 1914.

The geological work, which is directly under the charge of the State Geologist and the Assistant State Geologist, Professor Mathews, is divided into three divisions, covering the areas of the Piedmont Plateau, the Appalachian Region, and the Coastal Plain. Investigations are in progress in all these districts and extensive areas in each have already been studied. Reports have been issued for Allegany, Cecil, Calvert, St. Mary's, Prince George's, and Anne Arundel counties, while the investigations have been completed for Harford, Kent, Queen Anne's, Talbot, Caroline, and Washington counties. Work is now in progress in Baltimore, Frederick, Carroll, and Howard counties. In the conduct of the geological work the aid of numerous experts in various parts of the country has been sought, particularly in the study of the several groups of fossil animal and plant remains. Monographs on the Devonian, Lower Cretaceous, Upper Cretaceous, Eocene, Miocene, Pliocene, and Pleistocene deposits of the State have already been published, and similar reports on other formations are now in preparation. Special economic reports on building stones, clays, coals, limestones, and iron ores have been issued and work is now in progress on the fire-clays of Western Maryland and the water resources of the State.

The results of topographical work conducted in co-operation with the United States Geological Survey are presented to the public on the scale of one mile to one inch, in the form either of 15' sheets or of county maps, showing the topography and election districts. They present in a very detailed manner not only the relief of the land but cultural features as well. Maps of all the counties have already been published. Two additional sheets of the map of Baltimore and vicinity on the scale of 1000 feet to the inch have been issued during the year.

The investigations in terrestrial magnetism, hydrography, agricultural soils, and forestry have been proceeding as hitherto in co-operation with State and National bureaus. The agricultural soil survey of Howard County was completed during the past field season in co-operation with the United States Bureau of Soils. The forestry work is now, for the most part, in charge of the later-organized State Board of Forestry, but the Geological Survey continues to publish county reports and maps on this subject.

THE MARYLAND WEATHER SERVICE

The Maryland Weather Service has been in existence for twenty-six years, having been organized in May, 1891, under the joint auspices of the Johns Hopkins University, the Maryland Agricultural College, and the United States Weather Bureau. It was established as an official organization by the General Assembly of 1892, the Act being approved by the Governor in April of that year. The State Weather Service under this Act was permanently placed at the Johns Hopkins University, under the direction of a Board of Control nominated by the heads of the three institutions above mentioned, and subsequently commissioned by the Governor. The appropriation for the maintenance of the Bureau was \$2,000 annually up to September 30, 1916, the fund being used mainly for investiga-

tions relating to the climatology of the State. Professor Clark has been the chief of the Bureau since its organization. The Service received no appropriation from the last Legislature but has an adequate balance of unexpended funds to meet current expenses.

The Weather Service has published, in addition to many minor reports and bulletins, three large final volumes, the first dealing with the physiography and meteorology of the State at large, the second with the climate and weather of Baltimore and vicinity, and the third with the distribution of plant life, particularly in its relations to climate and soils.

The Weather Service has taken up, under the direction of Professor Livingston, of the Johns Hopkins University, a quantitative study of the results of climatic factors upon vegetation. By growing various cultivated plants at different stations throughout the State under similar soil conditions and keeping a careful quantitative record of their growth, changes, and physiological activity, it is expected that accurate data will be obtained showing the result of the varying climatic conditions on crop production. A preliminary pamphlet has already been issued.

Another important line of work is the study of the rainfall which is being conducted by Dr. Fassig, Chief of the Baltimore office of the United States Weather Bureau. In connection with this and in co-operation with the State Geological Survey and State Department of Health an investigation of the surface and underground water resources of the State is in progress.

THE MARYLAND FORESTRY BUREAU

An Act was passed by the General Assembly of 1906 providing for a State Board of Forestry, to consist of seven members, four of whom are *ex officio* the same as the commissioners of the Geological Survey, the fifth is the State Geologist, while the sixth and seventh are appointed by the Governor.

Professor Clark is the executive officer of the Board and has been authorized by it to see that the provisions of the Act are carried out. Mr. F. W. Besley is the State Forester. Under this Act \$3,500 were appropriated for the first two years and \$4,000 annually for the succeeding four years, while an additional \$1,000 were appropriated by the General Assembly of 1910 to meet the expenses of publication of forestry maps. The Legislature of 1912 greatly increased the resources and powers of the State Board of Forestry by appropriating \$10,000 annually for the general expense of the Board, besides \$50,000 for the purchase of lands in the valley of the Patapsco River in Baltimore and Howard counties for a State Reservation, \$8,500 for the purchase of old Fort Frederick and the surrounding lands in Washington county, and \$6,000 for the publication of maps and reports. At the same time provision was made for the establishment of a State Forest Nursery, which is located on land put at the disposal of the Board by the Maryland Agricultural College, at College Park. The Legislature of 1914 passed laws, at the suggestion of the Board, providing for the preservation of roadside trees and the planting of shade trees along the highways. At the same time it prohibited the placing of unauthorized signs along

the public roads. The administration of these laws is in the hands of the Board. Upon the termination of the present continuing appropriation of \$10,000 annually on September 30, 1916, the General Assembly provided for the maintenance of the forestry work for the following two years, the sum of \$14,000 annually—\$5,000 of this amount to be employed each year for fire protection in co-operation with the United States Forest Service and \$1,000 for the care of the Patapasco Reservation.

The State Forester and his assistants have prepared plans for more economical forest management of the woodlands of the State and have, on request, given advice to a large number of owners of wood lots throughout the State. One of the chief aims of the Forestry Board has been the education of the people of the State in matters pertaining to forest management in order that the growing timber of the State may be utilized to the greatest advantage.

CO-OPERATION

Much aid has been rendered the several State bureaus above mentioned by the chiefs of the various Federal bureaus. Particular reference should be made to the co-operation granted by the Director of the United States Geological Survey, the Chief of the United States Coast and Geodetic Survey, the Chief of the United States Weather Bureau, the Chief of the United States Forest Service, the Director of the United States Bureau of Mines, and the Chief of the United States Bureau of Soils, all of whom have cordially supplemented the work of the State organizations in many ways. The work of the State bureaus is in progress along so many lines that it affords admirable opportunities for the students of the University to obtain much desired practical experience both in the field and in the laboratory; at the same time the State receives much benefit from the trained force of men which is always at its disposal.

WM. BULLOCK CLARK.

REPORT OF THE DIRECTOR OF THE BUREAU OF APPOINTMENTS

TO THE PRESIDENT OF THE UNIVERSITY:

I respectfully submit the following report of the activities of the Bureau of Appointments of this University for the academic year ending September 30, 1917.

During the year the Bureau has registered 39 graduate students, 8 undergraduates, and 25 former students and members of summer or afternoon courses. We have had 79 applications for teachers, for which we have recommended 41 candidates, 17 of whom have been appointed. We have had 13 applications for tutors, have made 11 recommendations and 9 appointments. We have had 19 applications for business positions, several for more than one applicant, for which we have made 32 recommendations and 30 appointments. We have also had a number of other inquiries that come under unclassified heads, for which we have made recommendations when we could, with about a fifty per cent. average of appointments. The letters and general correspondence and city telephoning in connection with the work of the Bureau have been as usual; and the work of the Bureau has taken the full office hour of the director every day through the year and has averaged more than an hour a day for his secretary. The increasing value of the Bureau seems to be borne out by the many letters which come in from graduates who have been placed in positions or helped to transfer from one position to a better one.

The next fall the Bureau purposes to send a slip to each undergraduate student asking him how much money he has made during the school year and during the vacation, so that that information can be added to its next annual report. An increasing number of applications from various commercial firms has come to the Bureau this year. In some cases direct recommendations are made, but in most cases notices have been put on the Bureau of Appointments' bulletin board near the postoffice, and students have been asked to make application direct if interested. The only difficulty I find about this plan is that several of the students have taken positions in that way and have failed to report the fact, which of course diminishes the number of appointments that the Bureau credits to itself.

The Bureau has also written scores of letters supplementary to those of the heads of departments, for which it takes no credit in its report, crediting itself only with appointments initiated in the office of the Bureau.

To this report I append a tabular list of applications for teachers, according to subject, with the number of appointments; a list of applications in general, with the number of recommendations and

appointments; and a statement of the present registration and of the correspondence of the Bureau.

	Applications	Recommendations	App'tm'ts
Teachers	79	41	17
Business	19	30	28
Dean	1	1	1
Curator	1	0	0
Guide	1	1	1
Housemaster	2	0	0
Laboratory assistant	1	1	1
Physician	1	0	0
Private Secretary	1	1	0
Reader	1	1	1
Tutor	12	12	8
Summer tutor	8	8	8
Y. M. C. A.	1	1	0

	Applications	Appointments
Arithmetic	2	1
Athletics	1	0
Biology	8	0
Chemistry	12	8
English	4	2
French	1	0
German	1	0
History	8	1
Labor Legislation	1	0
Latin	2	2
Mathematics	5	0
Physics	2	2
Political Economy	1	1
Political Science	1	0
Science	1	0
Spanish	1	1

REGISTRATION

Undergraduates	8
Graduate students	39
Former students	9
Summer School	6
College Courses for Teachers	3
Unclassified	7
	<hr/> 72
Letters	430
Circulars	117
Telegrams	15
Telephone calls	500

R. V. D. MAGOFFIN,
Director.

REPORT OF THE YOUNG MEN'S CHRISTIAN ASSOCIATION

TO THE PRESIDENT OF THE UNIVERSITY:

I beg to submit the following report of the activities of the Young Men's Christian Association for the year ending June 1st, 1917.

New Students' Work

Letters were sent to all new students previous to their coming to Baltimore. One thousand handbooks were distributed at the opening of the University and Medical School and each out-of-town student was aided in securing a suitable rooming place and boarding house. The opening reception to new students, given by the Y. M. C. A., was well attended in both departments, about 600 being present. A religious census was taken at the opening of the college year and all students have been put in touch with the church of their preference.

Membership

The membership at the University for the past year has been 142 and at the Medical School, 125. The work of the Association has not been confined to the membership alone, for many who were not members of the Association have been active in the work.

Chapel

Chapel has been conducted at the University each week, Mondays to Fridays, inclusive, by the Association with an average attendance of 19. This average may not seem very high, but when we consider that the men had to come at 8:40 A. M. we feel that it is very good. After the Easter vacation we did not attempt to continue chapel, for the reason that classes began at 8:30 A. M.

Bible Study

We have had two fraternity classes, with an average attendance of 34, and one class of graduate students in the Philosophical Department, with an average attendance of 24. One class was conducted in the Medical Department with an enrollment of 35. We have also co-operated with a number of classes in churches.

Deputation Work

We have supplied speakers for a number of the young people's organizations and boys' clubs of the city. Thirty-four men have been engaged in this form of work. We believe this to be one of the most important departments of the work of the Association. We have planned to place more emphasis upon this phase of work during the coming year.

Community Service

In the Academic Department 14 men have given from one to two nights a week to conducting boys' clubs, teaching English to foreigners and other forms of community service. The greater number of these men have been engaged at the West Park Recreation Centre, at Hampden. In the Medical Department 24 men have been active in hospital service, boys' clubs, medical aid to poor families and work with the Federated Charities.

Missions

Eighteen men were enrolled in mission study. Twenty-four attended the State Missionary Conference. Twenty-seven foreign students have been enrolled in the different departments of the University, and we have tried in every way to interpret the highest American ideals to them.

The Association arranged a course of eight Life Work addresses at the University, with an average attendance of 90. We believe that these meetings were of great value to the students. At the Medical School 20 meetings have been held with an average attendance of 45.

During the week before Christmas the Hopkins Y. M. C. A. joined a number of other colleges and universities in this country in an effort to raise \$150,000 for the Prison Relief Work in Europe. We started out to raise \$1,000 of this amount and at the close of a three days' campaign, in which 50 men were active, \$700.25 had been raised. This money was forwarded to the International Committee of the Y. M. C. A. for distribution among the prison camps.

The past year has been very encouraging and we feel that the Association has come more nearly into the rightful place in the life of the University. The strongest men in the University have been active in the Y. M. C. A.

The following have been elected as officers for the coming year:

In the Academic Department—

W. H. Swartz, President.

R. G. Hoffman, Vice-President.

Charles T. Leber, Corresponding Secretary.

M. B. Carroll, Recording Secretary.

Harris E. Kirk, Jr., Treasurer.

In the Medical Department—

B. Douglas, President.

P. J. Bowman, Vice-President.

W. C. Huyler, Secretary.

R. K. Ghormley, Treasurer.

Finances

The expenditures for the year, including salaries, printing, stenographic work, and current miscellany, amounted to \$873.00; the receipts were \$928.30 in the Academic Department and \$124.00 in the Medical School, which included the University appropriation, membership dues, contributions from the Faculty, the Students, Alumni, and business men, and payment for advertising in the Hand-book.

A. E. LINDLEY,

General Secretary.

DEGREES CONFERRED, 1916-17

DOCTOR OF PHILOSOPHY

Charles Clinton Bramble, of Centreville, Md., Ph. B., Dickinson College, 1912. *Subjects*: Mathematics, Astronomy, and Geological Physics. *Dissertation*: A Complete System for a Collineation Group Isomorphic with the Group of the Double Tangents of a Plane Quartic. *Referees on Dissertation*: Professors Morley and Coble.

Grace Bagnall Branham, of Baltimore, A. B., Bryn Mawr College, 1910; A. M., Johns Hopkins University, 1916. *Subjects*: English, Philosophy, and French. *Dissertation*: The Metaphysical Poets. *Referees on Dissertation*: Professors Bright and Lovejoy.

John Leo Campion, of New York, N. Y., A. M., Columbia University, 1912. *Subjects*: Germanic Philology, German Literature, and English. *Dissertation*: Ulrich von Türheim: *Tristan*. Nach allen bekannten Handschriften. *Referees on Dissertation*: Professors Collitz and H. Wood.

Leslie Cornelius Cox, of Bowmanville, Ont., A. B., University of Toronto, 1913. *Subjects*: Latin, Greek, and Sanskrit. *Dissertation*: The Artistic Use of the Love Charm in Greek and Latin Literature. *Referees on Dissertation*: Professors Smith and Mustard.

Ray Harbaugh Dotterer, of Baltimore, Ph. B., Franklin and Marshall College, 1906; A. M., Johns Hopkins University, 1916. *Subjects*: Philosophy, Psychology, and Education. *Dissertation*: The Argument for a Finitist Theology. *Referees on Dissertation*: Professors Lovejoy, Dunlap, and Morley.

Boris Emmet, of Washington, D. C., A. B., University of Wisconsin, 1913. *Subjects*: Political Economy, Political Science, and History. *Dissertation*: Profit Sharing in the United States. *Referees on Dissertation*: Professors Hollander and Barnett.

Edgar McCreary Faber, of Gettysburg, Pa., S. B., Pennsylvania College, 1914. *Subjects*: Chemistry, Physical Chemistry, and Mineralogy. *Dissertation*: The Esterification of Acetic and Propionic Acids by Methyl, Ethyl, Propyl, Iso-butyl and Iso-amyl Mercaptans. *Referees on Dissertation*: Professor E. E. Reid and Frazer.

Early Lee Fox, of Front Royal, Va., A. B., Randolph-Macon College, 1909; A. M., Johns Hopkins University, 1914. *Subjects*: History, Political Science, and Political Economy. *Dissertation*: The American Colonization Society (1817-1840). *Referees on Dissertation*: Professors Latané and Vincent.

Raymond Freas, of Baltimore, A. B., Wittenberg College, 1906. *Subjects*: Chemistry, Physical Chemistry, and Bacteriology. *Dissertation*: Esterification Limits of Benzoic and Toluic Acids with Lower Alcohols. *Referees on Dissertation*: Professors E. E. Reid and Lovelace.

Edward Elway Free, of San Francisco, Cal., A. B., Cornell University, 1906. *Subjects*: Plant Physiology, Geology, and Physical Chemistry. *Dissertation*: The Oxygen Requirement of Plant Roots in Relation to Soil Aeration. *Referees on Dissertation*: Professors Livingston and Johnson.

Neil Elbridge Gordon, of Baltimore, Ph. B., Syracuse University, 1911. *Subjects*: Chemistry, Physical Chemistry, and Mathematics. *Dissertation*: The Solubility of Liquids in Liquids. The Partition of the Lower Acids between Water and Cottonseed Oil. Also the Partition of Formic Acid between Water and Various Organic Compounds. *Referees on Dissertation*: Professors E. E. Reid and Lovelace.

Walter Scott Hastings, of Snow Hill, Md., A. B., Princeton University, 1910. *Subjects*: French, Italian, and Spanish. *Dissertation*: The Drama of Honoré de Balzac. *Referees on Dissertation*: Professor Armstrong and Mr. Carcassonne.

George Remington Havens, of Shelter Island Heights, N. Y., A. B., Amherst College, 1913. *Subjects*: French, Spanish, and Italian. *Dissertation*: The Abbé Prévost and English Literature: A study of his Literary Criticism. *Referees on Dissertation*: Professor Armstrong and Mr. Carcassonne.

Frank Merrill Hildebrandt, of Baltimore, A. B., Johns Hopkins University, 1913. *Subjects*: Plant Physiology, Physical Chemistry, and Botany. *Dissertation*: A Physiological Study of the Climatic Conditions of Maryland as Measured by Plant Growth. *Referees on Dissertation*: Professors Livingston and Johnson.

Allan Wilson Hobbs, of Guilford College, N. C., A. B., Guilford College, 1907, and Haverford College, 1908. *Subjects*: Mathematics, Physics, and Astronomy. *Dissertation*: On a Problem of Projectiles. *Referees on Dissertation*: Professors Morley and Cohen.

Henry Fuller Holtzclaw, of Moro, Ark., A. B., University of Arkansas, 1913. *Subjects*: Political Economy, Mathematics, and Political Science. *Dissertation*: The Lumber Industry and Trade. *Referees on Dissertation*: Professors Hollander and Barnett.

Roger Howell, of Baltimore, A. B., Johns Hopkins University, 1914. *Subjects*: Political Science, Law, and History. *Dissertation*: The Privileges and Immunities of State Citizenship. *Referees on Dissertation*: President Goodnow and Professor Latané.

Elizabeth Frieuch Johnson, of Manassas, Va., A. B., Goucher College, 1911; A. M., Johns Hopkins University, 1916. *Subjects*: German Literature, Germanic Philology, and Italian. *Dissertation*: Weckherlin's Eclogues of the Seasons. *Referees on Dissertation*: Professors H. Wood and Collitz.

Harry Isaac Johnson, of Daleville, Va., A. B., Roanoke College, 1912. *Subjects*: Chemistry, Physical Chemistry, and Mineralogy. *Dissertation*: The Conductivity and Dissociation of Certain Inorganic and Organic Salts in Formamid and in Mixtures of Formamid with Ethyl Alcohol. *Referees on Dissertation*: Professors E. E. Reid and Frazer.

Earl Steinfeld Johnston, of Strasburg, Pa., Ph. B., Dickinson College, 1913. *Subjects*: Plant Physiology, Physical Chemistry, and Physics. *Dissertation*: The Seasonal March of Climatic Conditions in a Greenhouse, as related to Plant Growth. *Referees on Dissertation*: Professors Livingston and Johnston.

Ethel Dorothea Kanton, of Baltimore, A. B., Goucher College, 1911; A. M., Johns Hopkins University, 1913. *Subjects*: English, Germanic Philology, and Philosophy. *Dissertation*: Character-Writing in English Literature during the Eighteenth and Nineteenth Centuries. *Referees on Dissertation*: Professors Bright and Smith.

Malcolm Horace Lauchheimer, of Baltimore, A. B., Johns Hopkins University, 1914. *Subjects*: Political Science, Law, and Political Economy. *Dissertation*: Labor Law of Maryland. *Referees on Dissertation*: President Goodnow and Professor Barnett.

Edward Lyons, of Baltimore, S. B., Washington and Lee University, 1912. *Subjects*: Chemistry, Physical Chemistry, and Mineralogy. *Dissertation*: The Identification of Acids. *Referees on Dissertation*: Professors E. E. Reid and Lovelace.

Arthur Lewis McCobb, of Boothbay Harbor, Me., A. B., Bowdoin College, 1905; A. M., Harvard University, 1910. *Subjects*: Germanic Philology, German Literature, and History. *Dissertation*: The Double Preterit Forms *gie-gienc*, *lie-lies*, *vie-vieno* in Middle High German. *Referees on Dissertation*: Professors Collitz and H. Wood.

William Frederick Meggers, of Clintonville, Wis., A. B., Ripon College, 1910; A. M., University of Wisconsin, 1916. *Subjects*: Physics, Mathematics, and Astronomy. *Dissertation*: Wave-Length Measurements in Spectra from 5600 Å to 9600 Å. *Referees on Dissertation*: Professors Ames and Pfund.

Clarke Cothran Minter, of Davidson, N. C., S. B., Davidson College, 1913. *Subjects*: Chemistry, Physical Chemistry, and Mathematics. *Dissertation*: The Osmotic Pressure of Concentrated Glucose Solutions. *Referees on Dissertation*: Professors Frazer and Lovelace.

Fred Loomis Mohler, of Carlisle, Pa., A. B., Dickinson College, 1914; A. M., Johns Hopkins University, 1916. *Subjects*: Physics, Astronomy, and Mathematics. *Dissertation*: Resonance Radiation of Sodium Vapor excited by One of the D Lines. *Referees on Dissertation*: Professors R. W. Wood and Pfund.

Elias N. Rabinowitz, of Baltimore, A. B., Haverford College, 1903; Jewish Theological Seminary, New York. *Subjects*: Hebrew, Arabic, and Egyptian. *Dissertation*: "Strê Ham-ma'loth," or the Songs of the Return. *Referees on Dissertation*: Professors Haupt and Ember.

Edna Moore Robinson, of Chicago, Ill., A. B., University of Chicago, 1907. *Subjects*: English, Greek, and Germanic Philology. *Dissertation*: Tennyson's Use of the Bible. *Referees on Dissertation*: Professors Bright and Greene.

Jesse Squibb Robinson, of Boston, Pa., A. B., Allegheny College, 1911. *Subjects*: Political Economy, Political Science, and History. *Dissertation*: The Amalgamated Association of Iron, Steel, and Tin Workers: A Study in Trade Unionism. *Referees on Dissertation*: Professors Hollander and Barnett.

Thomas Hunton Rogers, of Danville, Ky., A. B., Centre College, 1914. *Subjects*: Chemistry, Physical Chemistry, and Mathematics. *Dissertation*: A Study of the Vapor Pressure and Osmotic Pressure of Aqueous Solutions of Mannite at 20°. *Referees on Dissertation*: Professors Frazer and Lovelace.

Francis Metcalf Root, of Oberlin, O., A. B., Oberlin College, 1911. *Subjects*: Zoology, Plant Physiology, and Botany. *Dissertation*: Inheritance in the Asexual Reproduction of *Gentropyxis Aculeata*. *Referees on Dissertation*: Professors Jennings and Mast.

Aaron Schaffer, of Baltimore, A. B., Johns Hopkins University, 1914. *Subjects*: German Literature, Germanic Philology, and French. *Dissertation*: George Rudolf Weckherlin: The Embodiment of a Transitional Stage in German Metrics. *Referees on Dissertation*: Professors H. Wood and Collitz.

Virgil Bernard Sease, of Little Mountain, S. C., A. B., Newberry College, 1908. *Subjects*: Chemistry, Physical Chemistry, and Applied Electricity. *Dissertation*: A Study of the Vapor Pressure of Aqueous Solutions of Potassium Chloride at 20°. *Referees on Dissertation*: Professors Frazer and Lovelace.

Kemper Simpson, of Baltimore, A. B., Johns Hopkins University, 1914. *Subjects*: Political Economy, Philosophy and Mathematics. *Dissertation*: A New Class of Industrial Flotations in the United States (1906-1916). *Referees on Dissertation*: Professors Hollander and Barnett.

William Taylor Thom, Jr., of Lexington, Va., S. B., Washington and Lee University, 1913. *Subjects*: Geology, Economic Geology, and Physical Chemistry. *Dissertation*: Problems of the Cretaceous-Eocene Boundary in Montana and the Dakotas. *Referees on Dissertation*: Professors Clark and Berry.

William Edward Tottingham, of Madison, Wis., S. B., Massachusetts Agricultural College, 1903; M. S., University of Wisconsin, 1908. *Subjects*: Plant Physiology, Physiological Chemistry, and Botany. *Dissertation*: A Preliminary Study of the Influence of Chlorides upon the Growth of Certain Cultivated Plants. *Referees on Dissertation*: Professors Livingston and Johnson.

Sam Farlow Trelease, of Urbana, Ill., A. B., Washington University, 1914. *Subjects*: Plant Physiology, Botany, and Physical Chemistry. *Dissertation*: The Relation of Salt Proportions and Concentration to the Growth of Young Wheat Plants in Nutrient Solutions containing a Chloride. *Referees on Dissertation*: Professors Livingston and Johnson.

Vivian Voss, of Pretoria, S. Africa, A. B., Transvaal University College, 1913; A. M., Johns Hopkins University, 1916. *Subjects*: Physics, Astronomy, and Mathematics. *Dissertation*: The Ratio of the Intensities of the D Lines of Sodium. *Referees on Dissertation*: Professors R. W. Wood and Pfund.

Bruce Wade, of Trenton, Tenn., S. B., Vanderbilt University, 1913. *Subjects*: Geology, Paleontology, and Physical Chemistry. *Dissertation*: The *Gastropoda* of the Ripley Formation in Tennessee. *Referees on Dissertation*: Professors Clark and Berry.

Howard Crosby Warren, of Princeton, N. J., A. B., Princeton University, 1899. *Subjects*: Psychology, Philosophy, and Education. *Dissertation*: A History of the Association Psychology from Hartley to Lewes. *Referees on Dissertation*: Professors Watson and Lovejoy.

Gilbert Hayes Whiteford, of Glyndon, Md., S. B., Maryland Agricultural College, 1897; A. M., Columbia University, 1912. *Subjects*: Chemistry, Physical Chemistry, and Biological Chemistry. *Dissertation*: A Study of the Decomposition of Silicates by Barium Salts. *Referees on Dissertation*: Professors Frazer and Lovelace.

Ralph Coplestone Williams, of Baltimore, A. B., Johns Hopkins University, 1908. *Subjects*: French, Italian, and Spanish. *Dissertation*: The Theory of the Heroic Epic in Italian Criticism of the Sixteenth Century. *Referees on Dissertation*: Professors Shaw and Armstrong.

Lucy Wilson, of Waban, Mass., A. B., Wellesley College, 1909. *Subjects*: Physics, Physical Chemistry, and Astronomy. *Dissertation*: The Structure of the 2536 Mercury Line. *Referees on Dissertation*: Professors R. W. Wood and Pfund.

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DOCTOR OF MEDICINE

James Burns Amberson, Jr., of Waynesboro, Pa., Ph. B., Lafayette College, 1913.

James Kerr Anderson, of Pittsburgh, Pa., A. B., Washington and Jefferson College, 1913.

Walter Thomas Anderson, of Washington, Pa., A. B., Washington and Jefferson College, 1913.

John Herman Baird, of Newark, O., A. B., Kenyon College, 1913.

Horace McMurran Banks, of Shepherdstown, W. Va., A. B., Washington and Lee University, 1913.

Burton Elias Belcher, of St. Petersburg, Fla., S. B., Florida State College, 1905.

William Campbell Blake, of Birmingham, Ala., S. B., Howard College, 1913.

Irene M. Blanchard, of Normal, Ill., A. B., University of Michigan, 1898.

Leo Brady, of Baltimore, A. B., Johns Hopkins University, 1913.

Rowland Sill Briggs, of Sacramento, Cal., S. B., University of California, 1913.

William Lewis Brosius, Jr., of Gallatin, Mo., A. B., University of Missouri, 1915.

G. Bedford Brown, Jr., of Georgetown, Ky., S. B., Georgetown College, 1912, and Yale University, 1913.

Hugh Max Bullard, of Newberry, Pa., S. B., Bucknell University, 1913.

Curle Latimer Callander, of Fargo, N. D., A. B., Harvard University, 1913.

Alice Berry Carroll, of Columbia, O., A. B., Ohio State University, 1911.

John Meynard Carter, of Columbia, Mo., A. B., University of Missouri, 1914.

George Arthur Clark, of Holyoke, Mass., S. B., Hamilton College, 1913.

Hallie Marguerite Clark, of Roxbury, N. Y., S. B., Syracuse University, 1912.

Herman Porter Davidson, of Lexington, Va., A. B., Washington and Lee University, 1913.

Wilburt Cornell Davison, of Brooklyn, N. Y., A. B., Princeton University, 1913; A. B., University of Oxford, 1915, and B. Sc., 1916.

Karl Hermann Doege, of Marshfield, Wis., S. B., University of Wisconsin, 1914.

Howard Philip Doub, of Beaver Creek, Md., A. B., Western Maryland College, 1913.

Raymond Durstan Fear, of Holland Patent, N. Y., A. B., Hamilton College, 1913.

Hubert William Fowle, of Baltimore, A. B., Williams College, 1910.

Morris Frishman, of Pittsburgh, Pa., S. B., University of Pittsburgh, 1913.

Herman Anderson Gailey, of Cardiff, Md., A. B., St. John's College, 1913.

Thomas Owen Gamble, of Jasper, Ala., S. B., University of Alabama, 1912.

Leslie Newton Gay, of Shamokin, Pa., Ph. B., Lafayette College, 1913.

Gordon Lewis Groover, Jr., of Savannah, Ga., A. B., Washington and Lee University, 1912.

Ruth Alline Guy, of New York, N. Y., A. B., Barnard College, 1912.

George Edward Webb Hardy, Jr., of Baltimore, A. B., Johns Hopkins University, 1913.

Frank Wilbur Hartman, of Elliott, Ia., A. B., Knox College, 1913.

George William Henry, of Oswego, N. Y., A. B., Wesleyan University (Conn.), 1912.

Robert Val Hoffman, of Hagerstown, Md., A. B., St. John's College, 1913.

Leslie Benjamin Hohman, of Kansas City, Mo., A. B., University of Missouri, 1912.

Sarah Ernestine Howard, of Boston, Mass., A. B., Wellesley College, 1911.

Waddie Pennington Jackson, of South Hill, Va., A. B., Randolph-Macon College, 1910.

Louis Llewellyn Jacobs, of Norfolk, Va., A. B., Johns Hopkins University, 1913.

John Hall Janney, Jr., of Brookeville, Md., S. B., Earlham College, 1913.

Robert Wilkinson Johnson, Jr., of Baltimore, A. B., Princeton University, 1912.

Joseph W. Ketzky, of Montgomery, Ala., S. B., Alabama Polytechnic Institute, 1912.

Merle William King, of Baltimore, A. B., Allegheny College, 1908.

John Christian Koch, of Athens, Ga., S. B., University of Georgia, 1904.

Alfred C. Kolls, of La Crosse, Wis., S. B., University of Wisconsin, 1914.

Harry Linden, of Baltimore, A. B., Johns Hopkins University, 1912.

Frederick Hamilton Linthicum, of Baltimore, A. B., Loyola College, 1912.

Coen L. Luckett, of Terre Haute, Ind., A. B., University of Illinois, 1914.

Hubert Melville Mann, of Schenectady, N. Y., A. B., Union College, 1913.

Eli Kennerly Marshall, Jr., of Charleston, S. C., S. B., College of Charleston, 1908; Ph. D., Johns Hopkins University, 1911.

Karl Henry Martzloff, of Portland, Ore., A. B., University of Oregon, 1913.

James Shearer McCartney, Jr., of Washington, Pa., A. B., Washington and Jefferson College, 1913.

Frederick Francis McGauley, of Schenectady, N. Y., S. B., Union College, 1912.

Claude Vincent McMeen, of Enola, Pa., Ph. B., Dickinson College, 1913.

Morley Daniel McNeal, of Cherokee, Ia., A. B., State University of Iowa, 1913.

Katherine Krom Merritt, of Stamford, Conn., A. B., Vassar College, 1908.

Gilbert Richard Micklethwaite, of Portsmouth, O., S. B., Ohio University, 1913.

Frederick A. Miller, of Hagerstown, Md., A. B., St. John's College, 1912.

Theodore Sidney Moise, Jr., of Savannah, Ga., A. B., University of Georgia, 1913.

Hubert Maurice Nicholson, of Muskogee, Okla., S. B., University of Oklahoma, 1912.

Edward Novak, of Baltimore, A. B., Johns Hopkins University, 1913.

Louis Ernest Payne, Jr., of Leonardtown, Md., A. B., St. John's College, 1912.

DeLos Schuyler Pulford, Jr., of Tacoma, Wash., S. B., Trinity College (Conn.), 1912.

Ralph Lewis Reber, of Reading, Pa., Ph. B., Franklin and Marshall College, 1913.

John L. Rice, of New Haven, Conn., S. B., Wesleyan University (Conn.), 1912.

Irl Cephas Riffin, of Windsor, Va., A. B., Western Maryland College, 1913.

Bertram Julian Sanger, of Waco, Tex., A. B., University of Texas, 1913.

Edwin William Schultz, of Lomira, Wis., S. B., Winona College of Agriculture, 1913; A. B., University of Michigan, 1914.

Robert G. Sharp, of Chula Vista, Cal., S. B., University of California, 1911, and Ph. D., 1914.

Joseph Pardoe Shearer, of Milton, Pa., S. B., Bucknell University, 1913.

James Winn Sherrill, of Temple, Tex., A. B., Baylor University, 1913.

George Marsden Shipton, of Pittsfield, Mass., A. B., Williams College, 1913.

David Nathaniel Shulman, of Baltimore, A. B., Johns Hopkins University, 1913.

Eben Elliott Smith, of Dillsboro, Ind., S. B., Moore's Hill College, 1913.

Merrill Clary Sosman, of Chillicothe, O., A. B., University of Wisconsin, 1913.

Richard Henry Staehle, of Newark, N. J., S. B., Princeton University, 1913.

Frank Williams John Stafford, of Detroit, Mich., A. B., University of Michigan, 1914.

Robert Boyd Stewart, of Toronto, Ont., A. B., University of Toronto, 1905, and B. Sc., 1909.

John Louis Stifel, of Pittsburgh, Pa., A. B., Harvard University, 1913.

Cyrus Cressy Sturgis, of Pendleton, Ore., S. B., University of Washington, 1913.

William Shakespeare Summers, of Columbia, Mo., A. B. and S. B., University of Missouri, 1914.

Mark Hopkins Tibbetts, of Shirland, Ill., S. B., Parsons College, 1912.

William Smith Tillett, of Charlotte, N. C., A. B., University of North Carolina, 1913.

Max Tischler, of Wilkes-Barre, Pa., Ph. B., Lafayette College, 1913.

Nial Franklin Twigg, of Cumberland, Md., A. B., St. John's College, 1913.

Margaret Tyler, of Newton Centre, Mass., A. B., Mt. Holyoke College, 1913.

Hobart Stanford Van Nostrand, of Little Neck, N. Y., S. B., Colgate University, 1913.

Isabel Mary Wason, of Lowell, Ind., A. B., Western College for Women, 1911.

Robert Alexander Webb, Jr., of Louisville, Ky., A. B., Southwestern Presbyterian University, 1910.

John Bonar White, of Abbeville, S. C., A. B., Davidson College, 1910.

George Richard Wilkinson, of Baltimore, S. B., Davidson College, 1912.

Frank Dallam Worthington, of Belair, Md, A. B., Princeton University, 1913.

Mary Wright, of Great Barrington, Mass., A. B., Vassar College, 1911.

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MASTER OF ARTS

Stanhope Bayne-Jones, of New Orleans, La., A. B., Yale University, 1910; M. D., Johns Hopkins University, 1914. *Subject: Pathology. Essay: The Blood Vessels of the Heart Valves. Referees on Essay: Professors Welch and Ford.*

Hubert Morse Blalock, of Raleigh, N. C., A. B., University of North Carolina, 1916. *Subject: Political Science. Essay: Martial Law. Referees on Essay: President Goodnow and Professor Latané.*

Robert Allen Castleman, Jr., of Elkridge, Md., A. B., George Washington University, 1915. *Subject: Physics. Essay: The History of Diffraction. Referees on Essay: Professors R. W. Wood and Pfund.*

John Knisely Dunlap, of Baltimore, A. B., Albright College, 1914. *Subject: History. Essay: The Pennsylvania-Virginia Boundary Dispute. Referees on Essay: Professors Latané and Vincent.*

Mary Gover, of Baltimore, A. B., Goucher College, 1913. *Subject: Zoology. Essay: Orientation of Phoxus Pleuroneustes to Light; including a Study of the Relation between Intensity of Light and Rate of Movement, with its Bearing upon Theories of Orientation. Referees on Essay: Professors Jennings and Mast.*

Elizabeth Greene, of Greenfield, Mass., A. B., Smith College, 1913. *Subject: Education. Essay: A Study of the Inheritance of Mental Disorders; Its Biological, Educational, and Social Significance. Referees on Essay: Professors Buchner and Meyer.*

Sallie Adelaide Guerrant, of Christiansburg, Va., A. B., Centenary College (Tenn.), 1896. *Subject: History. Essay: American Trade with the British West Indies, 1783-1832. Referees on Essay: Professors Latané and Vincent.*

Joseph Poyer Deyo Hull, of Walden, N. Y., Ph. B., Hamilton College, 1913. *Subject: Geology. Essay: The Development of Soil Classifications. Referees on Essay: Professors Clark and Mathews.*

Julian Chase Smallwood, of Syracuse, N. Y., M. E., Columbia University, 1903. *Subject: Mechanical Engineering. Essay: An Analysis of Boiler Stack Performance. Referees on Essay: Professors Christie, Thomas, and Whitehead.*

Frederick Courtney Tarr, of Baltimore, A. B., Johns Hopkins University, 1915. *Subject*: Spanish. *Essay*: Substantive Clauses Governed by a Preposition in the Novels of Benito Pérez Galdós. *Referees on Essay*: Professors Marden and Armstrong.

George Wan, of Kiangsi, China, A. B., Government University of Peking, 1912. *Subject*: Political Science. *Essay*: The Development of Political Parties in China. *Referees on Essay*: President Goodnow and Professor Latané.

Helen Dorothy Welsh, of Baltimore, A. B., Goucher College, 1915. *Subject*: History. *Essay*: The Open-Door Policy in China. *Referees on Essay*: Professors Latané and Vincent.

Jean Curley Wilcox, of Baltimore, A. B., Goucher College, 1915. *Subject*: French. *Essay*: L'Idéal domestique de Jean-Jacques Rousseau d'après "La vie au château de Wolmar" dans la nouvelle *Hélène*. *Referees on Essay*: Professor Armstrong and Mr. Carcassonne.

(13)

BACHELOR OF ARTS

Cecil Hopkins Bagley, of Harford County, Md.

Myron Everhart Bagley, of Harford County, Md.

Lawrence Henry Baker, of Baltimore County, Md.

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Ho-Chin Chen, of Hangchow, China.

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Francis Howard Wilson, of Harford County, Md.

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Jesse Myron Upperco, of Baltimore County, Md.
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William David Webb, of Harford County, Md.
Walter Evans Weeks, of Baltimore.
Bertram Seager Winchester, of Baltimore.
Walter Alexander Wood, Jr., of Baltimore County, Md.
Louis McComas Young, of Washington County, Md.

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BACHELOR OF SCIENCE

Agnes Emilie Buchholz, of Baltimore.
Mary Stella Johnson, of Thomson, Ga.
Elsie Louise Wirth, of Baltimore.

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JOHNS HOPKINS UNIVERSITY CIRCULAR, No. 300

DECEMBER, 1917

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THE
JOHNS HOPKINS
UNIVERSITY CIRCULAR

STG

REPORT OF THE PRESIDENT
OF THE UNIVERSITY
1917-18

BALTIMORE, MARYLAND
PUBLISHED BY THE UNIVERSITY
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Johns
STG

ANNUAL REPORT
OF
THE PRESIDENT OF
THE JOHNS HOPKINS UNIVERSITY
1917-18



BALTIMORE
THE JOHNS HOPKINS PRESS
1918
A. L. L.

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UNIVERSITY CIRCULAR

New Series, 1918, No. 10

DECEMBER, 1918

Whole Number, 310

ANNUAL REPORT OF THE PRESIDENT

TO THE TRUSTEES OF THE JOHNS HOPKINS UNIVERSITY:—

Gentlemen:

I have the honor to submit to you my annual report as President of the University for the academic year ending September 30, 1918. Attached hereto are the reports from the different departments of the University, which contain a statement both of the work done during the year and of some of our most pressing needs.

The past year has necessarily been much affected by the war in which the country has been engaged. Many of our instructors were occupied in government work and the number of students, apart from the medical school, has been greatly reduced. In the year 1916-17 the total number of persons pursuing instruction at the University, including those in the late afternoon and evening courses, was 2667. During the past year instruction was given to but 2232.

The University has continued the work begun a year ago at the request of the Government. The schools of marine

engineering and navigation, conducted under the auspices of the Shipping Board, have been attended by 766 men, of whom 200 have secured their licences. Many of those who have not received their licences are now getting the sea service required by law for positions in the American Mercantile Marine. The graduate laboratory of the Department of Chemistry has been giving almost its entire energy to the solution of war problems.

MEDICAL SCHOOL

The Medical School has suffered a great loss in the deaths of Theodore Caldwell Janeway and Dr. Franklin Paine Mall, who were taken from us at the beginning of the year. Dr. Janeway up to the time of his death was serving his country in the Medical Department of the United States Army. Both Dr. Janeway and Dr. Mall were cut off at the height of their powers. They will be greatly missed both at the University and in the broader field of scientific investigation.

DEPARTMENT OF ENGINEERING

In addition to the regular work of the department, which was seriously affected by war conditions, considerable work was done at the instance of the United States Government which had a direct bearing on the conduct of the war. Professor Whitehead was given leave of absence to accept the commission of Major of Engineers and was assigned to the Naval Consulting Board to carry out an experimental investigation of an important war problem. This investigation was made for the most part in the laboratory of the Engineering Department. Professor Whitehead, it may be added, received from the Franklin Institute of Philadelphia the Edward Longstreth Medal of Merit. Professor Thomas continued the work he entered upon in connection with the Hog Island Ship Yards.

At the request of the War Department a special course in

Radio Communication was given. Eight of the students taking the course subsequently entered the Signal Corps.

The Night Courses for Technical Workers, the undertaking of which was made possible by the support of the manufacturers and business men of Baltimore, have been continued. A new departure for the University when established two years ago, they have more than justified themselves. Through them the University has been able to place its facilities and laboratories at the service of the local community which is rapidly becoming more industrial in character.

SCHOOL OF HYGIENE AND PUBLIC HEALTH

Further progress has been made in the organization of the faculty of this department. Professor Raymond Pearl, formerly of the University of Maine and now connected with the United States Food Administration, will fill the chair of Biometry and Vital Statistics; Dr. Carroll G. Bull, now connected with the Rockefeller Institute of Medical Research, will be Associate Professor of Immunology. Arrangements have also been made for a series of public lectures on sanitary subjects. The construction of the new building has been prevented because of war conditions, but the school will open as announced in October, 1918, in the old physical laboratory.

THE SUMMER COURSES

The Summer Courses were given as usual, but with a considerably reduced attendance. The University was fortunate in being able to coöperate with other local agencies. Among these may be mentioned the Board of School Commissioners of Baltimore which located one of its vacation schools at Homewood, the Maryland State College of Agriculture and the State Board of Education, which provided the instructors and supervised the courses given with the purpose of supplying vocational teachers of the type encouraged by the Smith-Hughes Act.

NEEDS OF THE UNIVERSITY

The University still feels the need of an increased endowment applicable for general purposes. I can only repeat what was said in my last report.

"An increased endowment is necessary in the first place to make it possible for us to carry on our work on its present scale without a continually recurring deficit, and second to provide for necessary salary increases.

"On the other hand salary increases are now even more imperative than ever, because of the continual increase in the cost of living. If we cannot in some measure meet this increase, we may not be able to keep with us some of the most valuable members of our teaching force.

"We need, of course, some new buildings to do our work in the most effective manner. We can, however, for the present do without them, if absolutely necessary. But we must have greater resources if we are to continue to do even the work we are now doing, which is chargeable to our general funds."

FINANCIAL STATEMENT

The Financial Report, showing in detail the operations for the year ending June 30, 1918, and the condition of the University finances on that date, has been published, and copies may be obtained from the Treasurer by those interested. Reference to this report will reveal the following facts:

The operations of the year resulted in an		
excess * of expenditures over ordinary in-		
come of.....		\$67,128.40
On Philosophical and Collegiate Account....	\$39,403.03	
and on Medical School Account.....	27,725.37	

* Covered by Hopkins Maintenance Fund for 1917-18 of \$70,000.00

The excess for the preceding year was.....	\$69,692.12
For Philosophical and Collegiate Departments	\$33,120.51
For the Medical School.....	36,571.61
	<hr/>
A decrease this year of.....	\$2,563.72
It will be noted that the deficit on the Philosophical and Collegiate account increased during the year as compared with the year before.....	6,282.52
And the deficit in the Medical School decreased	8,846.24
	<hr/>
Making a net decrease as above of.....	2,563.72
	<hr/>
The total income from operations for the year was....	\$777,296.99
An increase this year of.....	67,981.10

This increase came from the following sources:

Rockefeller Foundation Appropriations for School of Hygiene and Public Health	\$86,079.25	
Increase in income from Endowment Funds.....	8,214.59	
	<hr/>	\$94,293.84
Less—		
Decrease in Tuition Fees due to War conditions, \$18,678.61; the use of State Appropriation, \$5,656.95; and in miscellaneous receipts, \$1,977.18,		
Total	26,312.74	
	<hr/>	\$67,981.10

Of the total income, the amount received from students was 16 per cent., the income from invested funds 42 per cent., from the State of Maryland 9 per cent., and from other items 33 per cent.

The total operating expenses for the year were..... \$774,425.39

A net increase for the year of..... \$65,417.38

This increase is accounted for as follows:

Appropriations of the Rockefeller Foundation for School of Hygiene and Public Health	\$86,079.25
Less decrease in salaries, \$6,613.74; in wages, \$6,056.45; in apparatus and books, \$7,991.68 (all due to war conditions), Total.....	20,661.87
	<hr/>
	\$65,417.38

The amount paid for salaries during the year constituted 61 per cent. of the total expenses, the amount paid for expenses 29 per cent., and the amount paid for apparatus, equipment, and other items 7 per cent.

The increase in the income of the University shown in the statement above set forth, is largely due to appropriations of the Rockefeller Foundation for the School of Hygiene and Public Health, although the income in the general endowment funds also increased the income from that source by \$8,214.59.

Included in the income of the University are also, of course, the payments amounting to \$70,000 on account of the Hopkins Maintenance Fund which, fortunately, prevented the University from being obliged to face a current deficit of \$67,128.40.

The result of the increase noted in income is that again we closed the year without a deficit. This result is, of course, extremely gratifying. It does not, however, in any way make less necessary the endeavor to secure a larger endowment. The loss of students due to war conditions has materially reduced our income from tuition fees. On the other hand the maintenance fund which has been such a help to us during the year can be relied on only for the coming year.

ASSETS AND LIABILITIES (JUNE 30, 1918)

The University has Assets as follows:

Stocks, Bonds, Productive Real Estate, etc., belonging to Endowment Funds,	\$6,623,545.84
Bonds, etc., belonging to Special Funds,	34,000.00
Plant, Equipment, etc.—	
Howard St. Buildings.....	\$ 990,189.16
Medical School Buildings.....	187,028.34
Homewood Land and Development..	2,277,736.20
New Hunterian Laboratory.....	127,136.34
Equipment, Books, etc.	675,342.88
	<hr/> 4,257,432.92
Accounts receivable.....	85,468.66
Cash on hand.....	16,360.75

Making Total Net Assets (Book Value) \$11,016,808.17

Corresponding to Liabilities, i. e., Funds
and Balances, as follows:

Permanent Endowments (Trust Funds)	
Funds Consolidated for investment	\$5,238,504.28
Funds separately in- vested	1,868,765.23
	<hr/> \$7,107,269.51
Unexpended Income of Special Funds..	40,674.42
Sundry Open Accounts.....	86,492.37
Engineering School Building Fund.....	37,542.75
	<hr/> \$7,271,979.05

Leaving \$3,744,829.12

Which is represented by—

Plant, Equipment, etc.....	\$4,257,432.92
Unrestricted Bequests.....	225,093.91

\$4,482,526.83

Against which has been charged

Loss on investments....	\$ 17,283.41
Deficit in Operations to date	330,741.57
Homewood Development in excess of Funds available	389,672.73

\$737,697.71

\$3,744,829.12

These liabilities deducted should be offset by cash on hand and good current assets. That such is not the case is due to the fact that the University has had to provide cash to meet the accumulated deficits of \$330,741.57 and an amount from General Account for Homewood Development, \$389,672.73, a total of \$720,414.30—an amount \$5,163.61 less than the total at the beginning of the year, which in view of general conditions may be considered satisfactory.

The University has a number of unrestricted legacies, which, together with the proceeds of the University property on Howard Street, when sold, could be applied to liquidate the above liabilities.

In addition to these present assets, the University is interested as remainderman in a number of estates which will be available on the termination of existing life estates. These amount in all to about \$800,000. There are, apart from the liabilities just enumerated, no debts or obligations except that under the will of John W. McCoy the University must pay an annuity, etc., of \$950, which will terminate on the expiration of the life tenancy.

GIFTS AND BEQUESTS

It is a pleasure to be able to report another favorable year so far as concerns the gifts and bequests which the University has received, viz.:

Isaac Forester Nicholson Fund increased during the year by gift of \$10,000.

A. Z. Hartman Memorial Scholarship Fund, \$5,000, established by the heirs of the late Susanne M. Hartman. [For description of this fund, see Financial Statement, page 41.]

Income from William H. Grafflin Fund made available during the year for research in Industrial Chemistry and for a scholarship of \$1,000 per annum to a student of eminent proficiency in this branch. [For description of this fund, see Financial Statement, page 41.]

For a Fellowship in Education, \$500.

For "Modern Language Notes," \$100 each from Mrs. Julia E. Bartlett and Miss Lillian Detrick.

Additional gift from Miss Detrick of \$100 to be used at the discretion of the President.

For research in Civil Engineering, \$100 from Mr. R. C. Thomsen.

For the Mathematical Fund, \$25 from Miss Teresa Cohen.

Anonymous gift of \$500 for support of the laboratory of Plant Physiology.

Subscription of E. I. Dupont de Nemours Co. for fellowships in Chemistry, \$1,500.

Annual gift from Mr. J. E. Aldred of \$5,000 for the Aldred Lectures and expenses in connection therewith.

Annual gift from Mr. Kenneth Dows of \$17,500 for support of the Dows Tuberculosis Clinic; and an additional gift of \$2,000 for the equipment of the Tuberculosis laboratory.

Anonymous gift of \$5000 for the Department of Art as Applied to Medicine.

Gift for support of the Department of Psychiatry, \$8,500.

PERSONAL MENTION

The University has suffered the loss, through death, of several of its best-known teachers.

Dr. Franklin Paine Mall, who had been Professor of Anatomy in the Medical School since 1893, died November 17, 1917. He was a member of our staff from 1886-89, holding a fellowship and an instructorship in pathology and bacteriology. He then spent four years in the faculty of the University of Chicago and came back to us when the Medical School was opened in the fall of 1893. In 1913 he was made Director of the Department of Embryology of the Carnegie Institution of Washington.

Dr. Theodore Caldwell Janeway, Professor of Medicine since 1914, died of pneumonia December 27, 1917. Dr. Janeway had been Bard Professor of the Practice of Medicine in

Columbia University for several years before coming to Baltimore, a member of the Board of Directors of The Rockefeller Institute for Medical Research, and Secretary of the Russell Sage Institute of Pathology. He was also physician-in-chief to the Johns Hopkins Hospital.

Dr. Edward Henry Spieker, Collegiate Professor of Greek, died February 20, 1918. He was a member of the first class graduated as Bachelors of Arts of this University (in 1879), and three years later received the degree of Doctor of Philosophy. He held successively the posts of Fellow, Instructor, Associate, Associate Professor, and Collegiate Professor of Greek. He was Secretary of the Board of Collegiate Studies, of the Board of University Studies, and of the Johns Hopkins Philological Association. He was a skilful teacher and a valuable helper in many lines of university endeavor.

The department of Mathematics has suffered a serious loss through the resignation of Dr. Arthur B. Coble, Associate Professor of Mathematics, who accepted a call to the University of Illinois in June. Dr. Coble spent twenty years in this university as student and teacher, receiving the doctor's degree in 1902.

Appointments and promotions for the year 1918-19 have been made as follows:

Philosophical and Engineering Faculties

André Morize, to be Associate Professor of French Literature.

William B. Kouwenhoven, Dr. Ing., formerly Associate, Associate Professor of Electrical Engineering.

John H. Bringham, B. C. E., formerly Associate, Associate Professor of Civil Engineering.

Walter A. Patrick, Ph. D., formerly Associate, Associate Professor of Physical Chemistry.

Myrick W. Pullen, S. B., formerly Instructor, Associate in Electrical Engineering.

Ellis Miller, Ph. D., formerly Instructor, Associate in Chemistry.

Erasmus Buceta, Dr. en Derecho, formerly Instructor, Associate in Spanish.

Julian C. Smallwood, M. E., A. M., formerly Teaching Fellow, Associate in Mechanical Engineering.

Robert A. Stewart, Ph. D., formerly Instructor, Associate in Romance Languages.

Faculty of Hygiene and Public Health

Raymond Pearl, M. D., Professor of Vital Statistics and Biometry.

Carroll G. Bull, M. D., Associate Professor of Immunology.

John R. Miner, A. M., Associate in Statistics.

George H. Robinson, Ph. D., Associate in Bacteriology.

Reynold A. Spaeth, Ph. D., Associate in Physiological Hygiene.

Paul Eaton, M. D., Instructor in Bacteriology.

Sylvia M. Parker, A. M., Instructor in Statistics.

Florence Powdermaker, B. S., Instructor in Chemical Hygiene.

Percy D. Meader, A. M., Assistant in Bacteriology.

Gertrude C. Mosshart, Research Assistant in Statistics.

Recent appointments in the Medical Faculty are mentioned in the report of the Dean (see Appendix).

JOHNSTON SCHOLARSHIPS

The incumbents of the Johnston Scholarships were William Foxwell Albright (Ph. D., Johns Hopkins University, 1916), Instructor in this University the previous year in the department of Semitic Languages; Alexander Green (Ph. D., Columbia University, 1914), recently Instructor in the University of Illinois, in Germanic Philology; Robert William Hegner (Ph. D., University of Wisconsin, 1908), Assistant Professor in the University of Michigan, in the department of Zoölogy.

COMMEMORATION DAY

The University observed its forty-second anniversary with public exercises in McCoy Hall on the morning of Friday, February 22. The opening prayer and the benediction at the close were said by the Rev. Edwin B. Niver, D. D., Rector of Christ Church. The chief speaker was Dr. Alonzo E. Taylor, Professor of Physiological Chemistry in the University of Pennsylvania and a member of the National Food Administration. His subject was "Limiting Factors in the Food Supply of the Nation at War." The President described

the work of the University during the preceding twelve months, and then conferred degrees as follows: Doctor of Philosophy upon four persons; Master of Arts, one; Bachelor of Arts, three; Bachelor of Science, three. The general Alumni Association held its annual meeting at the Johns Hopkins' Club in the evening; the usual banquet was omitted. The addresses of Dr. Taylor and the President are printed in the *University Circular*, February, 1918, together with the proceedings of the Alumni Association's meeting.

COMMENCEMENT

The exercises of the forty-first Commencement were held in Mc'oy Hall, Tuesday, June 11, at 4 o'clock. President Goodnow presided. The invocation and the closing benediction were said by the Rev. Harris E. Kirk, D. D., pastor of Franklin Street Presbyterian Church. Dr. Edward K. Graham, President of the University of North Carolina, was to be the chief speaker, but he was prevented by a sudden illness from coming to Baltimore. The following degrees (in course) were granted: Bachelor of Arts, thirty-one; Bachelor of Science in Engineering, eighteen; Bachelor of Science, five; Master of Arts, twelve; Doctor of Philosophy, eight; Doctor of Medicine, eighty-seven. In addition, degrees (*extra ordinem*) were given to twenty-one young men who completed the third-year's work in 1917 and have since been in military service,—Bachelor of Arts, thirteen; Bachelor of Science in Engineering, eight. The degree of Doctor of Laws (*honoris causa*) was conferred upon the Italian Ambassador at Washington, Count Macchi di Cellere, in recognition of his diplomatic service in this country. Professor Brush presented the Ambassador, and the degree was formally awarded by President Goodnow. The President then reviewed the work of the University during the year and addressed those who had received their diplomas. In view of war conditions the usual evening reception in honor of the graduates was omitted. The address of President Graham and that of the President

of the University are printed in the *University Circular*, July, 1918, together with the names of the graduates, the new appointments and promotions for the year 1918-19, and the honors of the students.

PUBLIC LECTURES AND ASSEMBLIES

Seven afternoon lectures on "Aspects of the World War" were given between February 27 and March 20. The lecturers and their subjects were: Professor J. H. Latané—The Tradition of American Isolation; Professor W. W. Willoughby—The Prussian Theory of the State; The Prussian Theory of Monarchy (two lectures); Professor V. L. Kellogg, Leland Stanford University—The Germans in Belgium and France; Dr. Winford H. Smith—Medical Aspects of the War; President Goodnow—The War and the Future of the Far East; Mr. Theodore Marburg—Plans to Discourage War.

Under the joint auspices of the University and the Women's Civic League, five lectures (the third series) on topics pertaining to "Food Production and Conservation," were given in McCoy Hall, January 11-29. The lecturers were Professor J. H. Hollander, President Woods, of the State College of Agriculture, Professor E. V. McCollum, and Mr. Edwin G. Baefjer, Food Administrator for the State of Maryland.

The second series of lectures on Engineering Practice established by Mr. J. E. Aldred was given in January, February and March. There were nine lectures by practical engineers and managers of industrial corporations, whose names and topics are listed in the statement of the Department of Engineering appended to this report.

Lieutenant Bruno Roselli, of the Royal Italian Army, spoke on "War Conditions in Italy," December 14.

Meetings commemorative of the late Professors Clark, Mall, and Janeway were held November 4, February 3, and March 17.

The Archaeological Institute of America, Baltimore Society, used the Civil Engineering hall for four afternoon lectures open to the public.

The twenty-first annual debate between representatives of the senior and junior classes was held March 16. The contest was won by the juniors, to whom were awarded the Adams Prizes. At the same time the public speaking contest between members of the sophomore class was held, and the Adams Medal was awarded to John H. Lewin.

The annual intercollegiate debate between teams representing the University of North Carolina, the University of Virginia, and this University was held April 27. Two teams from each institution contested, North Carolina winning both of its contests, the Johns Hopkins winning that with Virginia.

AWARD OF PRIZES

The Henrico Medallion, established by the Colonial Dames of America, Chapter I, was awarded for 1918 to James Miller Leake, Ph. D., 1914, in recognition of his published work entitled "The Virginia Committee System and the American Revolution."

The Tocqueville Medal, given annually by the Baron Pierre de Coubertin, of Paris, was awarded at Commencement to William Samuel Hoffman, A. B., 1918, who had delivered in the Spring the best speech on "Alsace-Lorraine the Test of Victory."

Respectfully submitted,

FRANK J. GOODNOW,
President.

September 30, 1918.

REPORTS ON THE INSTRUCTION IN THE CHIEF BRANCHES OF STUDY, 1917-18

Prepared by the Principal Instructors in the Several Departments

CHEMISTRY

The following courses of instruction were given during the year 1917-18:

I. *An elementary course of experimental lectures*, accompanied by classroom conferences and examinations and extending through the year.

II. *A laboratory course*, also extending through the year, which was taken simultaneously with Course I, and was designed to familiarize beginners with the experimental side of chemistry.

Courses I and II were under the direction of Professor Gilpin, who was aided by Dr. Miller and two assistants.

III. *Systematic Inorganic Chemistry*, a lecture course extending through the year, taken by undergraduates who had previously completed courses I and II, and by some undergraduates from other institutions.

IV. *A laboratory course*, extending through the year, in the reactions and preparations of inorganic compounds and in quantitative and qualitative analysis. This course was taken in conjunction with Course III.

Courses III and IV were under the direction of Dr. Miller, who was aided by laboratory assistants.

V. *Systematic Organic Chemistry*, a course of lectures given by Professor Gilpin, which extended through the year and was taken by the more advanced undergraduates and by less advanced graduates from other institutions.

IV. *A laboratory course*, under the direction of Professor Gilpin in the reactions and preparations of organic compounds.

VII. *Advanced Inorganic Chemistry*, a course of lectures by Associate Professor Lovelace, which extended through the year.

VIII. *Advanced Organic Chemistry*, a course of lectures, extending through the year, by Professor Reid.

IX. *A laboratory course*, extending through the year, in the reactions and preparation of organic compounds, by Professor Reid.

X. *Quantitative Chemistry*, a laboratory course, extending through the year, by Professor Frazer.

XI. *Physical Chemistry*, a course of lectures, extending through the year, by Dr. Patrick.

XII. *Physical Chemical Methods*, a laboratory course conducted by Dr. Patrick.

XIII. *History of Chemistry*, A course of lectures by Professor Remsen.

XIV. *Quantitative Chemistry*. A course of lectures by Professor Frazer.

RESEARCH

The research forces of the department have been entirely devoted to war problems.

PUBLICATIONS

On account of war conditions very little was published during the year.

E. Emmet Reid.

Studies in Identification. IV. The Identification of Alcohols. *Journal Amer. Chem. Soc.* 39, 1249 (1917).

E. Emmet Reid, and Raymond Freas.

Studies in Esterification. X. The Esterification of Benzoic and the Toluic Acids by Methyl, Ethyl, and Propyl Alcohols. *Jour. Amer. Chem. Soc.* 40, 560 (1918).

B. F. Lovelace.

Editor: Chemical Directory of the United States.

STUDENTS

The number of students working in the Chemical Laboratory was 143. Of these 26 were graduate students, 23 of them following Chemistry as their principal subject.

One student was promoted to the degree of Doctor of Philosophy, viz., E. B. Helm, the subject of whose dissertation was Adsorption of Vapors by Active Charcoal.

E. EMMET REID,
Secretary, Chemical Staff.

CLASSICAL ARCHAEOLOGY AND ART

The work in Classical Archaeology and Art has been carried on by means of the Archæological Seminary, various courses of lectures and practical exercises, demonstrations in the museum of the University, and especially by means of conferences with individual students. The members of the Seminary, meeting weekly, devoted their attention to topics and problems in Sculpture and Roman Numismatics.

In addition to his direction of the Seminary for the year, Professor Robinson lectured once a week through the year on the History of Greek and Roman Sculpture and once a week through the year on Greek Inscriptions. He also lectured once a week through the year on Roman Art and Archæology. In the courses for teachers he conducted the course on the History of Art for the first half year. In the Greek Department he gave readings once a week from Plato's Republic with commentary and lectures on the Platonic ideas. He also lectured once a week on Greek Literature and taught the class in Greek I after Professor Spieker's death.

During the Christmas holidays at the annual meeting of the Archæological Institute of America and the American Philological Association, Professor Robinson read a paper on "A Cylix in the Style of Duris." On March 14, at a joint meeting of the Baltimore Classical Club and the Baltimore Society of the Archæological Institute, he gave an illustrated lecture on "Caricature in Classical Literature and Art." At the annual meeting of the College Art Association held at the Metropolitan Museum, New York, on March 28, he read a paper on "Reproductions for the College Museum and Art Gallery," and was made vice-president of that Association. At a meeting of the Baltimore School Art League held at the University April 22, the honorary president, Professor Robinson, gave an informal address on "The Archæological and Art Objects at the Johns Hopkins University."

Lectures were given under the auspices of the Archæological Society by Professor Victor Horta, Director of the School of Fine Arts, Brussels; Professor Charles T. Currelly, Director of the Royal Ontario Museum, Toronto; and Professor Lewis B. Paton, of Hartford Theological Seminary. Students of the Archæological Department attended these lectures as part of their work.

Needs.—The needs of the Department of Archaeology and Art, which was established only thirteen years ago, and which has received inadequate appropriations, are great. Many of the important archæological publications are lacking in the library and funds are especially needed to purchase photographs, to mount and care for those we have, and to buy some of the more expensive illustrated archæological books, to provide a fine collection of lantern slides, and to purchase antiquities and casts to add to our excellent archæological museum. Funds are also needed to publish a catalogue of the museum and especially of the beautiful collection of coins, which was recently presented by one of our former trustees, Mr. Buckler. Ultimately a chair of mediæval and modern art should also be established. Money is needed for all these things and there are always many

opportunities for archaeological research such as the excavation of Sardis, which has already yielded things of the highest artistic and linguistic importance, the inscriptions being published by Mr. Buckler and Professor Robinson.

PUBLICATIONS

David M. Robinson.

Translations of the Harmodious Hymn by Thomas Moore, and other modern versions. *The Johns Hopkins University Circular*, No. 296, 1917, p. 31. Cf. also *Classical Weekly*, x, pp. 138-142.

Review of Babcock's Greek Wayfarers and Other Poems. *Art and Archaeology*, vi, 1917, p. 220.

Review of Stobart's The Glory that was Greece. *The Classical Weekly*, xi, 1917, pp. 21-22.

Review of Fox's Greek and Roman Mythology. *The Classical Weekly*, xi, 1917, pp. 22-23.

Review of Tatlock's Greek and Roman Mythology. *Art and Archaeology*, vi, 1917, p. 124.

Portraits of Van Dyck which have come to America. *Art and Archaeology*, vi, 1917, pp. 253-256.

A Note on the so-called Sappho bust. *Art and Archaeology*, vi, 1917, pp. 285 ff.

On Reproductions for the College Museum and Art Gallery. *Bulletin of the College Art Association of America*, No. 3, 1917, pp. 15 ff.

Caricature in Ancient Art. *Bulletin of the College Art Association of America*, No. 3, 1917, pp. 65-68. Cf. also Caricature in Classical Literature and Art, *The J. H. U. News Letter*, March 18, 1918.

Review of Banks' The Seven Wonders of the Ancient World. *The Classical Weekly*, xi, 1918, pp. 150-151.

Review of Dawkins' Modern Greek in Asia Minor. *The Classical Weekly*, xi, 1918, p. 175.

Seventh Annual Meeting of the College Art Association of America. *Art and Archaeology*, vii, 1918, pp. 151-152.

Editorial work for *Art and Archaeology*, *The Classical Weekly*, and the Johns Hopkins Philological Association, 1917-1918, published in *The Johns Hopkins University Circular*, June, 1918.

DAVID M. ROBINSON,

*Professor of Classical Archaeology and Epigraphy,
and Lecturer on Greek Literature.*

EDUCATION

The year was marked by the appearance of Nos. 1 and 2 of *The Johns Hopkins University Studies in Education*. This publication was officially authorized as a means of issue for important extended studies in this field completed at this institution, as well as elsewhere. The first two numbers are listed in the publications below.

The instruction maintained in the Department of Education was modified in accordance with certain changes in the staff. At the beginning of the year, Dr. Bird T. Baldwin, Lecturer in Education, resigned in order to accept the directorship of, and to organize, the Children's Welfare Institute, established by recent appropriation of the Legislature of Iowa at the University of Iowa. Dr. David E. Weglein, Principal of the Western High School, Baltimore, entered upon his duties as Instructor in Education, devoting his attention to the field of secondary education. The University is now enabled to offer a wider scope of representative work in the two fields of educational practice, namely, elementary and secondary.

The Educational Seminary continued to devote its attention to the field of educational administration and to the administrative aspects of the problems of specific professional interest to its members. The instruction was directed by Professor Buchner. Special reports and papers were presented, as follows: J. H. Owens, *Studies on Maryland High Schools: "Cost of Teaching English," "The Amount of the Academic and the Professional Training of Teachers"*; W. H. H. White, *"Measuring the Efficiency of County School Administration"*; Flora D. Sutton, *"Failures in Algebra and Geometry in the High School"*; H. J. Kefauver, *"Testing the Efficiency of Teachers"*; Sister Xavier, *"The Junior High School"*; R. M. Heine, *"High School Preparation and College Admission in Maryland"*; Selma M. Borchardt, *"Teacher Training as a Part of Community Co-operation."* The studies by J. H. Owens and W. H. H. White were completed and presented to the University as meeting the formal requirements of the essay for the degree of Master of Arts.

The work in Experimental Education, announced by Dr. B. T. Baldwin, was continued under the direction of Professor Buchner. Reports of the following studies were made: E. A. Morgan, *"History and Development of Normal School Organization and Curricula"*; O. R. Ortmann, *"Tests of Musical Ability"*; Sister Xavier, *"Correlation of Abilities in the Formal Operations in Arithmetic and in Algebra"*; H. J. Kefauver, *"Some Results Obtaining in a high school Psycho-Educational Laboratory"*; J. H. Owens, *"Qualitative Differences in Secondary Teaching as Shown by Statistical Analysis of the High School Staff on the Basis of Salary, Percentage of Time Devoted to Teaching, and Number of Different Subjects Taught"*; Dorris S. Hough, *"Educational Values in the Girl Scout Organization"*; Selma M. Borchardt, *"Mental Fatigue in School Children"*; J. Grape, *"The Adaptability of the Junior High School to Educational Conditions in Baltimore"*; A. Picker, *"Tests of the Results of Physical Training."*

The scope of advanced instruction was extended so as to include a course on supervision in the elementary school which was conducted by Miss Florence E. Bamberger. The results of special studies in this field were reported as follows: J. Grape, "The Validity of the Ayres Spelling Scale"; R. R. Long, "A Test of the Jones' Spelling 'Demons' in the Third and Fourth Grades of Baltimore City"; Philena M. Hutton, "Correlation of Achievement in Some Standard Tests and Teachers' Marks in the Same Subjects"; Sister Xavier, "The Use of Standardized Tests as an Aid to Supervision," "The Organization of a Course in Supervision on the Project Plan"; Margaret E. Downey, "Bibliography of Free Folders Containing Valuable Information and Pictures for School-Room Use."

The National Headquarters Girl Scouts, of New York City, maintained a Girl Scout Fellowship in this department during the year, the holder being Dorris Soule Hough, A. B., Wellesley College, 1909.

Undergraduate Courses

As in former years, the instruction in this department, maintained in the College Courses for Teachers, was open to undergraduate students. The scope of this instruction as arranged a year ago has proved satisfactory in enabling students to meet both academic and professional requirements in the field of education.

Professor Buchner gave instruction in the History of Education, Principles of Education, and Educational Psychology, each course meeting two hours a week through the year.

Miss Bamberger conducted a course in Elementary Education, two hours a week through the year, with an additional hour on Elementary School Supervision. Various features of instruction in elementary grades were developed in the classroom by means of demonstration exercises with a number of classes of children who came to Homewood on Saturday forenoons.

Dr. Weglein gave a course on High School Organization and Classroom Management, two hours a week through the year. A minimum of twenty periods of observation of teaching in high schools was required of students in this course.

Under the new plan whereby regular University courses may be given at "extension centers" in the State of Maryland, instruction in education was given to two classes of public school teachers, meeting weekly, at Salisbury. Professor Buchner conducted the course on Principles of Teaching and Special Methods in Secondary School Subjects, and Miss Bamberger, the course on Elementary Education.

During the year Professor Buchner served as Vice-President and Chairman of Section I at the Pittsburgh meeting of the American Association for the Advancement of Science, was appointed a member of the Commission on Institutions of Higher Education of the Association of Colleges and Secondary Schools of the Southern States, and was delegated to represent the National Society for the Study of Education and the City of Baltimore at the Philadelphia meeting of the League to Enforce Peace. He also addressed the

Baltimore Education Association. Miss Bamberger addressed the County Teachers' Institute at Westchester, Pennsylvania, and delivered a series of lectures and conducted conferences in the first summer school of the Cleveland School of Education of Western Reserve University and the City of Cleveland during the third week in June.

PUBLICATIONS

E. F. Buchner.

The Nineteen Seventeen Summer Courses. *The Johns Hopkins Alumni Magazine*. Nov., 1917, pp. 35-41.

The Nineteen Seventeen Summer Courses of the Johns Hopkins University. *Fifty-first Annual Report of the State Board of Education of Maryland*, 1917. Baltimore, 1917, pp. 193-200.

F. E. Bamberger.

The Validity of the Ayres Spelling Scale (in collaboration). *School and Society*. Nov. 3, 1917, pp. 538 f.

D. E. Weglein.

The Correlation of Abilities of High School Pupils. *The Johns Hopkins University Studies in Education*, No. 1. Baltimore: The Johns Hopkins Press, 1917, pp. 100.

M. T. Dallam.

Is the Study of Latin Advantageous to the Study of English? *Educational Review*. Dec., 1917, pp. 500-503.

B. J. Grimes.

Free Materials Useful in Teaching Geography. *State of Maryland Teachers' Year Book*, 1917-1918. Baltimore, 1917, pp. 86-99.

B. J. Johnson.

Experimental Study of Motor Abilities of Children in the Primary Grades. *The Johns Hopkins University Studies in Education*, No. 2. Baltimore: The Johns Hopkins Press, 1917, pp. 62.

EDWARD F. BUCHNER,
Professor of Education.

 ENGLISH

1. Advanced Courses.

The advanced students in English are organized into a Seminary, which is conducted by Professor Bright. Graduate students are admitted to the Seminary as soon as they have satisfied initial requirements for specialization and research. The discipline of the Seminary is designed to impart training in scholarly methods of dealing with literary and linguistic problems. Study and investigation are bestowed on selected periods of literary and linguistic history, on departments of literature extending through successive periods, and on the works of important writers, taken separately or in groups.

Usually there is a change of subject each half-year. During the academic year 1917-1918, the sessions of the Seminary occupied four hours a week.

In the first half-year the Seminary was engaged in reviewing and analyzing the critical essays of the Eighteenth Century, from Addison to Burke. As a basis for the verification of theory respecting the development of the romantic method, the poetry of the Wartons, Churchill, Goldsmith, Crabbe, and Akenside was minutely studied. In the second half-year the work was centered in Wordsworth and Coleridge.

Professor Bright met a class twice a week for the study of the Indogermanic and Germanic relations of English. By lectures and conferences the history of the vowels and consonants (ending with the Anglo-Saxon forms) was treated in the first half-year. In the second half-year the work was bestowed on the vowel-system of the language, from Anglo-Saxon to present-day English.

Professor Bright conducted a pro-seminary in literary criticism, once a week.

He also gave a course in Anglo-Saxon (twice a week) that was to serve as an introduction to the historic study of the language and literature.

2. College Courses.

English Composition 1, a prescribed course in Rhetoric and English Composition, was given, three hours weekly, throughout the year. The class was organized in two large groups for weekly lectures and in six sections for recitation and practice. Associate Professor French lectured to Sections A, B, C, and D and Dr. Powell to Sections E and F. Mr. Litz met Sections A and C two hours weekly; Mr. Uhler, Section B; Mr. Cushing, Section D; and Dr. Powell, Sections E and F. A mimeographed edition of *Usage, Structure, and Style*, prepared for this course by Dr. French, was used as a text-book. The work of the course included the reading, month by month, of assignments in prose and verse.

English Composition 2, a new course in advanced composition, was conducted by Dr. Powell twice a week through the year. Classroom work consisted of the discussion of modern problems, the subject matter being taken from assigned reading, and themes were written at regular intervals. The chief aim of the course was to develop logical thinking and accurate expression.

English Literature 1 was given by Professor Greene, three hours a week, through the year. The study began at the introduction of printing in England, and included a survey of the revival of learning, of early experiments in the writing of artistic prose, and of the introduction of new forms of verse. The greater part of the study was bestowed upon the literature of the latter half of the reign of Queen Elizabeth. Poetry was studied in the forms of songs and lyrics, of epic in Book I of the *Faerie Queene*, and of drama in the comedies of Shakspeare. Attention was given to the voyages and explorations of the Elizabethan navigators. *Twelfth Night* was studied with care as an example of romantic comedy at its best. The private reading,

which was discussed in the classroom, included Book II of the *Utopia*, selections from Hakluyt's *Voyages*, Book II of the *Faerie Queene*, and six of the comedies of Shakspeare.

English Literature 2 was given by Professor Greene, three hours a week, through the year. During the first term a study was made of the English and Scottish Popular Ballads, and of the poems of Burns and Scott. During the remainder of the year the course included a study of poetry as represented in the writings of Wordsworth, Coleridge, Byron, Keats, and Shelley, and of the novels of Scott. In connection with the weekly lectures and discussions the members of the class did a large amount of private reading and prepared eight papers.

Associate Professor French gave an elective course in American Literature (English Literature 3), three hours weekly through the year. The first half-year was given to the literary and cultural history of America and the second half-year to a somewhat detailed study of selected works illustrative of the various literary types. Cairns's *A History of American Literature* and Bronson's *American Poems and American Prose* were used as text-books.

English Literature 4, prescribed for engineering students, was conducted by Dr. Powell three hours a week through the year. The course was divided into three parts, which embraced, respectively, the material of literature, the more important literary types, and the chief writers of England. Thus an effort was made to present literature first as philosophy, second as art, and third as the individual expression in artistic form of the thought of different historical periods. Results proved that this method of dealing with the problem of sophomore literature was encouragingly successful. No text-book was used, and the students were referred to the library for collateral reading.

English Literature 6 was given by Professor Greene, three hours a week, through the year. This course included (a) the reading and discussion of eight of the plays of Shakspeare, representing various types, and a careful study of *King Richard the Second* and of *Macbeth*; (b) a survey of the origin and development of the English drama from the liturgical plays to the decline of the drama. The class read and discussed representative Miracle Plays, Moralities, and Interludes; Early Comedy and Early Tragedy; representative plays by Lyly, Peele, Kyd, five plays by Marlowe, and two plays by Ben Jonson.

English Literature 7 was given by Professor Greene, three hours a week, through the year. During the first half-year a careful study was made of the minor poems of Milton and of Book I of *Paradise Lost*; Books II-IV were privately read by the members of the class. The second half-year was spent in the study (a) of English forms of verse; (b) of the writings of Dryden, Steele, Addison, and Pope; (c) of some of the literary features of the English Bible.

Public Speaking 1, a course in Reading and Public Speaking prescribed for undergraduates in their second year, was given, one hour a week, through the year. The class was taught in eight sections by Associate Professor French, Mr. Uhler, and Mr. Litz. The first half-

year was devoted to a study of the elementary principles of expression and to practice in reading. Selected shorter poems by Browning were used during this term as illustrative material. The work of the second half-year consisted of the study and practice of the occasional speech, both prepared and extemporaneous. Knapp and French's *The Speech for Special Occasions* was used as a text-book.

Public Speaking 2, an elective course in Public Speaking open to students who have completed Public Speaking 1, was given, one hour a week, during the first half-year by Associate Professor French. The work included the analysis of selected speeches and state papers by President Wilson. No text-book was used.

The Adams Contest in Public Speaking and Debate was held, after the usual preliminary contests, on March 16, 1918. The debate trophy and individual prizes were won by the Class of 1919, and the Adams Medal for public speaking by Mr. John H. Lewin. The annual triangular intercollegiate debate with the University of Virginia and the University of North Carolina, suspended last year on account of the war, was resumed, and the contests were held on April 27, 1918. First place was won by North Carolina and second by Johns Hopkins. Earlier in the year a debate was arranged between the sophomore and freshman classes. This was won, after a creditable contest, by the sophomore team. A debate between the freshmen of St. John's College, Annapolis, and the freshmen of Johns Hopkins, proposed by St. John's, was prepared for, but was abandoned upon the withdrawal of St. John's. The Tocqueville Medal Contest, a contest in oral discussion upon an assigned topic in modern French history, for a medal offered by the Baron Pierre de Coubertin, was held May 8, 1918. Three contestants, chosen out of a larger number by a preliminary trial, took part. The medal was won by Mr. William Samuel Hoffman.

3. College Courses for Teachers.

A course for teachers, designed to cover the same ground as the college course in English Composition 1, was given by Associate Professor French, twice a week, through the year. The same text, *Usage, Structure, and Style*, was used. In the criticism of themes, the instructor was assisted by Mr. T. Morris Cushing.

An introductory course in literature (English Literature 2) was conducted twice a week through the year by Dr. Powell. The course was made as nearly parallel as possible to English Literature 4 in the college program, though the required reading was altered somewhat in order to be better adapted to more mature students. During the first semester the work was conducted by lectures and recitations; during the second the lecture-method was used altogether.

PUBLICATIONS

James W. Bright.

Brief mention of the following books: J. E. Spingarn, *Creative Criticism: Essays on the Unity of Genius and Taste*;—E. A. Greening Lamborn, *The Rudiments of Criticism*;—C. H. Herford, *Is there a Poetic View of the World?*;—Eleanor N. Adams, *Old English Scholarship in England from 1566-1800*.—Marjorie

Latta Barstow, Wordsworth's Theory of Poetic Diction: a Study of the Historical Background of the Lyrical Ballads;—Ernest Carroll Moore, Fifty Years of American Education: a Sketch of the Progress of Education in the United States from 1867 to 1917;—Burgess Johnson, The Well of English and the Bucket;—Adelaide Crapsey, A Study in English Metrics. *Mod. Lang. Notes* (xxxii), November, 1917—(xxxiii), June, 1918.

John C. French.

The First Year at Homewood. *The Johns Hopkins Alumni Magazine*, vi, 30-34.

An Unpublished Poem by Poe. *The Dial*, lxiv, 121.

Poe and the *Baltimore Saturday Visiter*. *Mod. Lang. Notes*, xxxiii, 257-267.

Review of The Arden Shakespeare—The Merchant of Venice, ed. by H. L. Withers; A Midsummer Night's Dream, ed. by E. K. Chambers; As You Like It, ed. by J. C. Smith. *The American Journal of Philology*, xxxviii, 445, 446.

Brief mention of C. N. Greenough and F. W. Hersey, English Composition, *Mod. Lang. Notes*, xxxiii, 64;—J. F. Royster and Stith Thompson, The Manual and Notebook for English Composition, *Mod. Lang. Notes*, xxxiii, 191-192.

Chilton L. Powell.

Thackeray in Baltimore. *The Johns Hopkins Alumni Magazine*, vi, 186-201.

JAMES WILSON BRIGHT,
Caroline Donovan Professor
of English Literature.

GEOLOGY

The Geological Laboratory was opened daily throughout the year for graduate and undergraduate students. Lectures, field studies, and laboratory work were conducted as follows:

LECTURES

Undergraduate Courses

(a) Geology I: Physiography, Dynamical and Historical Geology, by Professor Swartz. *Three lectures and one afternoon of practical work each week throughout the year.*

(b) Geology II: Mineralogy and Elementary Petrography, by Professor Swartz. *Three lectures and two afternoons of practical work each week throughout the year.*

(c) Geology III: Applied Geology, by Professor Mathews. *Three lectures each week throughout the year.*

Graduate Courses

(d) Geological Physics, by Professor Reid. *Two lectures each week throughout the year.*

(e) Exploratory and Geological Surveying, by Professor Reid. *Two lectures each week throughout the year.*

(f) Petrography, by Professor Mathews. *Three lectures and two afternoons of laboratory work each week throughout the year.*

(g) Paleontology, by Professor Berry. *Two lectures and two afternoons of laboratory work each week throughout the year.*

(h) Advanced Historical Geology, by Professor Berry. *Two lectures each week throughout the year.*

(i) Ore Deposits of the United States, by Dr. Singewald. *Two lectures each week throughout the year.*

(j) Ore Deposits of South America, by Dr. Singewald. *Two lectures each week throughout the second half-year.*

(k) Meteorology, by Dr. Fassig. *One lecture each week for one-half year.*

(l) Geological Conferences. *Weekly, throughout the year.*

FIELD STUDIES

(m) The only regular field trip of any extent was that conducted by Dr. Swartz in Western Maryland. The more extended trips for graduate study were omitted because practically all of the older students of the Department enlisted in some service soon after the declaration of war.

(n) Summer work on the Maryland Geological Survey was more or less disarranged by war conditions. Ordinarily several of the graduate students are given an opportunity to carry on field work in connection with the various investigations which are being conducted by the Survey. These positions afford unusual opportunities for training in field methods. Payment for services and field expenses is provided.

LABORATORY WORK

(o) The Geological Laboratory was opened daily during the year for the work of advanced students under the direction of Professor Mathews and the other members of the staff.

ACTIVITIES

The Geological Department suffered an irreparable loss through the death of Professor William Bullock Clark, which occurred at his summer home on July 27, 1917. Dr. Clark succeeded the late Professor George Huntington Williams as Director of the Geological Laboratory in the fall of 1894, and during the twenty-three years of his incumbency greatly strengthened the Department along many lines. The number of students receiving their Ph.D. in geology during Professor Clark's connection with the Department was 53.

At the opening of the academic year the Department was reorganized under the supervision of a departmental committee. Professor Edward Bennett Mathews was elected Chairman and Professor Joseph T. Singewald, Jr., Secretary. Professor Mathews was appointed State Geologist of Maryland, in succession to Dr. Clark, with whom he had been associated since the inauguration of the Maryland Geological Survey, as well as Director of the Maryland State Weather Service and Executive Officer of the State Board of Forestry, offices previously held by Professor Clark. By these appointments the University secures the advantage of close co-operation with the several State bureaus mentioned, and the continuation of the scientific work previously conducted under the joint auspices of the State bureaus and the Geological Department of the University.

Professor Mathews spent a large part of the year in completing various lines of work in which he had been engaged with Dr. Clark. A report on The Materials for Rapid Railroad, Highway, and Fortification Construction was prepared for the War Department at the request of the National Research Council. The general scope of the report, which covered conditions along the entire Atlantic front, from Maine to Texas, had been arranged by Professor Clark, but the filling in of details and the editing of the reports furnished by geologists and highway authorities from eighteen States was done by Dr. Mathews as chairman of the committee. He was the author of the summary report of the committee and the special reports covering conditions in Delaware and in Maryland.

The establishment of numerous cantonments in Maryland called for numerous reports on the water resources and physical characteristics of the sites considered or selected by the War and Navy Departments. These were prepared by Professor Mathews and his associates of the Geological Department. The successful location of an abundant water supply at the Aberdeen Proving Grounds was the result of one of these studies.

Although conditions during the year were less favorable to scientific activities the investigation of the crystallines of the Maryland Piedmont was continued with the assistance of Dr. Bliss and additional maps were prepared for the Maryland Geological Survey. These include the Dundalk sheet of the 1,000-foot map of Baltimore and a special sheet on the scale of 1:125,000 showing the principal roads in the vicinity of Baltimore and Washington.

Professor Mathews was appointed by the Governor of Maryland as a member of the Maryland Council of Defense and chairman of the Committee on Natural Resources and Highways. He was also elected Dr. Clark's successor as Treasurer of the Geological Society of America.

Professor Reid, on his return from Europe, prepared a report for the National Research Council covering the results of his studies on the application of geology to military affairs along the Western front. Certain studies on magnetic compasses for aeroplanes were inaugurated and the seismological investigations of former years were continued.

Dr. O. L. Fassig has been on leave from the University to act as Director of the Signal Corps School of Meteorology at College Station, Texas. The training of meteorologists for this service, as first planned, would have been given at this University, but subsequent developments made it seem wiser to segregate the meteorologists in one of the cantonments already established.

Dr. Swartz has been engaged in the investigation of the Carboniferous of Maryland during the past year and has studied the typical area of the Allegheny formation in western Pennsylvania. He has prepared a preliminary report upon the Carboniferous of Maryland which is now ready for the printer. The monograph on the Silurian of Maryland, which has been prepared under his editorship and to which he has contributed a number of chapters, is now in press.

Professor Berry finished, during the year, the report on the Underground Waters of Maryland, and spent several months in field and office work for the United States Geological Survey in the preparation of a report on the marls and limestones of eastern North Carolina, a war-time economic report, which is now in press. During the year various collections have been examined for the U. S. Geological Survey and for the U. S. National Museum. He took part in the symposium of the Paleontological Society on the relations between North and South America and has in press three papers on the geology and paleobotany of Central and South America. During the year he prepared the article Paleobotany for the Encyclopedia Americana and an extended article on Fossil Plants for the Smithsonian Institution.

Associate Professor Singewald continued during the academic year the preparation of a textbook on the Mineral Deposits of South America, which was completed in the late spring. During the summer and fall he prepared reports for the Maryland Geological Survey on feldspar, flint, chrome, and manganese ores. A large part of the summer was also spent in field work in some of the West Virginia coal fields.

Dr. Gardner, who was engaged in a faunal study of Upper Oligocene fauna for the U. S. Geological Survey, was granted leave to serve with the Red Cross in France.

Dr. W. P. Woodring, who has been a Research Assistant on grant supplied by Messrs. Clarence W. Watson, T. Garland Tinsley, C. Wilbur Miller, S. G. B. Cook and others, was granted a leave of absence for investigation in Costa Rica and Panama. He subsequently entered the military service.

Dr. Harvey Bassler, Fellow by Courtesy and a graduate of some years' standing, continued his studies on the flora of the Maryland Carboniferous.

Julian D. Sears, Fellow by Courtesy, was granted a leave of absence for exploratory work in Costa Rica.

There were 10 advanced graduate students in the department, but owing to the unsettled circumstances due to the war none absolved the requirements for the degree of Doctor of Philosophy. Every major student in geology, before the end of the year, was either in the

service of the Government or on essential work calling for special training in geology.

PUBLICATIONS

Clark, Wm. Bullock.

The Geography of Maryland. *Md. Geol. Survey*, vol. x, pt. 1, pp. 39-167, 1918.

The Surface and Underground Water Resources of Maryland, including Delaware and the District of Columbia. *Md. Geol. Survey*, vol. x, pt. 2, pp. 171-542, 1918.

Reid, Harry Fielding.

The Earth: Its Figure, Dimensions and the Constitution of Its Interior; by T. C. Chamberlin, Harry Fielding Reid, John F. Hayford, and Frank Schlesinger. *Smithsonian Rept.* for 1916, pp. 225-254, 1917.

Mathews, Edward Bennett.

William Bullock Clark, Ph. D., LL. D. *Md. Geol. Survey*, vol. x, pp. 31-37, 1918.

The Surface and Underground Water Resources of Maryland, including Delaware and the District of Columbia; by Wm. Bullock Clark, Edward B. Mathews, and Edward W. Berry. *Md. Geol. Survey*, vol. x, pt. 2, pp. 171-542, 1918.

Report on the Water Resources of Delaware. Prepared for the use of the War Department. (MSS. 27 pp., 9 maps.)

Report on the Highway Materials of Delaware. Prepared for the use of the War Department. (MSS. 16 pp., 1 map.)

Report on the Highways Materials of Maryland. Prepared for the use of the War Department in co-operation with H. G. Shirley, Roads Engineer. (MSS. 72 pp., 4 maps.)

Report of the Committee on Materials for Rapid Railroad, Highway, and Fortification Construction. Prepared for the War Department, at the request of the National Research Council. Edward B. Mathews, Chairman Subcommittee on Road Materials, etc. (MS. 9 vols., 3 atlases of maps.)

Dundalk Sheet. Scale 1 inch equals 1000 feet. *Md. Geol. Survey*, 1917.

Map of Anne Arundel County Showing Topography and Election Districts. (2d edit.) *Md. Geol. Survey*, 1917.

Baltimore and Vicinity. Scale 1:125,000. *Md. Geol. Survey*, 1918.

Berry, Edward W.

Geological History indicated by the fossiliferous deposits of the Wilcox Group (Eocene) at Meridian, Mississippi. *U. S. Geol. Survey*, Prof. Paper 108E, June 1917.

A Middle Eocene Goniopteris. *Torrey Botanical Club Bulletin*, vol. xlv, pp. 331-335, pl. 22, 1917.

Rilly, A Fossil Lake. *Scientific Monthly*, pp. 175-185, figs. 1-3, August, 1917.

- Pleistocene Plants in the Marine Clays of Maine. *Torrey*, vol. xvii, pp. 170-163, figs. 1-3, 1917.
- William Bullock Clark. *Science*, n. s., vol. xlvi, pp. 104-106, Aug. 3, 1917; *Amer. Jour. Sci.* (iv), vol. xliv, pp. 247-248; *Geol. Mag.*, dec. 6, vol. iv, No. 9, p. 432.
- Fossil Plants from Bolivia and their bearing upon the age of uplift of the Eastern Andes. *U. S. Nat. Mus. Proc.*, vol. civ, pp. 103-164, pls. 15-18, Oct., 1917.
- The Fossil Plants from Vero, Florida. *Hour. Geol.*, vol. xxv, pp. 661-666, 1917; *Geol. Soc. Amer. Bull.*, vol. xxviii, pp. 197-198; *9th Ann. Rept. Fla. Geol. Survey*, pp. 19-33.
- A note on the "Age and Area" Hypothesis. *Science*, n. s., vol. xlvi, pp. 539-540, Nov. 30, 1917.
- Cyrille Grand'Eury. *Science*, n. s., vol. xlvi, pp. 62-63, Jan. 18, 1918.
- The Underground Waters of Maryland [with Wm. Bullock Clark and Edward B. Mathews]. *Md. Geol. Survey*, vol. x, part 2.
- Review of Arber, E. A. N., Earlier Mesozoic Flora of New Zealand. *Science*, n. s., vol. xlvi, pp. 518-519.
- Review of Guppy, H. B., Plants, Seeds and Currents in the West Indies and Azores. *Science*, n. s., vol. xlvi, pp. 612-615, June 21, 1918.
- A Restoration of Neocalamities. *Amer. Jour. Sci.*, vol. xlv, pp. 445-448, figs. 2, June, 1918.
- Review of Seward, A. C., Fossil Plants, vol. iii. *Science*, n. s., vol. xlvi, pp. 94-98, July, 1918; *Plant World*, vol. xxi, pp. 100-103, April, 1918.
- Notes on the fern genus *Clathropteris*. *Torrey Botanical Club Bulletin*, vol. xlv, pp. 279-285, figs. 2, Aug., 1918.
- The Jurassic Lagoons of Solnhofen. *Scientific Monthly*, vol. vii, pp. 361-378, 5 ff., Oct., 1918.
- Fossil Plants from the late Tertiary of Oklahoma. *U. S. Nat. Mus. Proc.*, vol. liv, pp. 27-636, pls. 94-95, 1918.

Singewald, Joseph T., Jr.

- Concentration Experiments with the Siliceous Red Hematite of the Birmingham District, Alabama. *U. S. Bureau of Mines, Bulletin* 110, 91 pp. and map, Washington, 1917.
- Magmatic Segregation and Ore Genesis. *Mining and Scientific Press*, vol. civ, pp. 733-736, 1917.
- Discussion of Manganese Ores of Russia, India, Brazil and Chile by E. C. Harder. *Trans. Am. Inst. Min. Eng.*, vol. lvi, p. 74, 1917.
- Discussion of Iron Ore Deposits of the Firmeza District, Cuba, by Max Roesler. *Trans. Am. Inst. Min. Eng.*, vol. lvi, pp. 129-133, 1917.
- Discussion of the Chilean Nitrate Industry, by A. H. Rogers and H. R. Van Wagenen. *Bull. Am. Inst. Min. Eng.*, April, 1918, pp. 846-847.

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The Manganese Ores of the Lafayette District, Minas Geraes, Brazil. *Trans. Am. Inst. Min. Eng.*, vol. lvi, pp. 7-24, 1917.

Some Andean Sulphur Deposits. *Bulletin Pan-American Union*, January, 1918, pp. 24-38.

The Fuel Situation in the Andean Plateaus. *Proc. Second Pan-American Scientific Congress*, vol. viii, pp. 709-717, 1917.

The Genesis of the Chilean Nitrate Deposits. *Proc. Second Pan-American Scientific Congress*, vol. viii, pp. 873-879, 1917.

Discussion of Genesis of the Chilean Nitrate Deposits with Lorenzo Sundt. *Economic Geology*, vol. xii, pp. 92-96, 1917.

Reeves, Frank.

The Absence of Water in Certain Sandstones of the Appalachian Oil Fields. *Econ. Geology*, vol. xii, pp. 354-378, 1917.

Dorsey, George E.

Outline of the Geological History of Venetia during the Neogene; by Guiseppe Stefanini. Translated by George E. Dorsey. *Amer. Jour. Sci.*, 4th ser., vol. xlv, pp. 299-312, 1917.

Thom, W. Taylor, Jr.

An Upper Cretaceous Seacoast in Montana. *Johns Hopkins Univ. Circ.*, n. s., No. 3, pp. 266-271, 1917.

Wade, Bruce.

New Generic Names for Upper Cretaceous Gastropoda. *Proc. Phila. Acad. Nat. Sci.*, vol. lxx, p. 114, 1918.

EDWARD BENNETT MATHEWS,
Chairman, Geological Staff.

GERMAN

The German Seminary, which is organized for the study of Modern and Middle High German Literature and Language, met three times weekly through the year, under the guidance of Professor Wood. During the first half-year Goethe's dramas on social upheaval and social regeneration brought about in Germany by the French Revolution were considered. Beginning with the *Gross Kopta* and the *Bürgergeneral*, centering in the *Natürliche Tochter*, and closing with the later *Maskenzüge*, more particularly with *Des Epimenides Erwachen*, the course was devoted to the literary study of those phenomena, of which the Fourth Act of the Second Part of *Faust* furnishes an epitome. During the second half-year, the literary work of five Middle High German poets, republished in the group known as *Minnesangs Frühling*, was studied, namely the Burggrafen von Regensburg and Rietenburg, Dietmar von Aist, Friedrich von Hünzen

and Heinrich von Morungen, the work centering on the last-named and on the question of his originality and of his minor obligations to Provençal poets.

The Germanic Seminary has for its object the philological study of the Old Germanic languages and the historical study of German grammar. The members of this seminary met twice weekly, under the direction of Professor Collitz, for the study of Old Scandinavian alliterative poetry. The specimens selected for interpretation from the Elder Edda were: the Voluspa, the Volundarkvidha, the Brot af Sigurdharkvidhu, and the Gudhrunarkvidha I. The study in detail of these ancient songs gave an opportunity for discussing problems both of text-criticism, grammar, meter, and, on the other hand, of mythology and the history of Old Germanic heroic poetry.

The Germanic Society, which is conducted by Professors Wood and Collitz, held five sessions, at which papers and preliminary studies by the members were read and discussed.

Before the University Philological Association (October meeting) Professor Wood read his inaugural address as President on *Opitz and Ronsard: The Approach to Late Renaissance Epic*, of which a summary has been published in the *Johns Hopkins University Circulars*, New Series, 1918, No. 6, pp. 6-7. Associate Professor W. Kurrelmeyer read a paper at the November meeting of the Association on *An earlier version of K. Ph. Moritz' Anton Reiser*, which has been published in the *Modern Language Notes*, January, 1918.

Professor Wood gave a graduate course, twice weekly, first half-year, on the work of two German Seventeenth Century authors, Opitz (the earliest *Gedichte*, produced in Silesia and Heidelberg, previous to the poet's journey to Holland), and Grimmelshausen (*Simplicissimus*). In particular, Grimmelshausen's leaning towards folk-lore and popular superstitions was compared with Defoe's attitude of superstitious rationalism towards the marvellous in his *Duncan Campbell, Serious Reflections of Robinson Crusoe*, etc. The prime object of the course was to fix the type and determine the international relations of the *Simplicissimus* as the supreme picaresque romance of the Germanic nations.

During the second half-year, Professor Wood gave a graduate course, twice weekly, on the German Drama in the first half of the Nineteenth Century. The authors receiving the chief share of attention were Heinrich von Kleist and Grillparzer. The latter's drama *Libussa* was in particular compared with Olemens Brentano's *Die Gründung Prags*.

Professor Wood read with a class of undergraduates, twice weekly through the year, Goethe's *Faust* and *Götz von Berlichingen*. As a supplementary course he gave, at the request of a committee of the above class, readings in and on the Second Act of the Second Part of *Faust*, weekly during the second half-year. In the Winter Classes for Teachers he gave a course, twice weekly, first half-year, on the classic and romantic elements respectively in Schiller's *Braut von Messina*, and in the style of H. von Kleist's *Die Familie Schroffenstein*, preceded by the reading of both plays. During the second half-year he read, with the same class, plays from the period of

1830 and later, illustrating critical and social upheavals and the inception of the modern social drama in Germany. The authors studied were: von Platen, *Der romantische Oedipus*, Gutzkow, *Das Urbild des Tartüffe*, Freytag, *Die Journalisten* and Hebbel, *Judith*.

The following graduate courses were given by Professor Collitz:

1. Gothic Grammar. *Twice weekly through the year*. An effort was made not to confine this course to a mere practical study of the Gothic language, but to combine it, as much as possible, with an outline of Comparative Germanic grammar. The latter, to be sure, is not only a matter of theory throughout, but largely one of conflicting views set forth by various scholars. Yet we must keep in mind that we do not study Gothic so much for its own sake as on account of the bearing it has on the problems of Historical and Comparative Germanic grammar.

2. Old High German. *Twice weekly through the year*. In the historical development of Germanic languages Old High German occupies a position intermediate between Gothic and Middle High German. Their acquaintance, therefore, with the latter two languages was an essential help to the students, especially in the grammatical part of the course. Selections from Tatian, the O. H. G. Isidor, and Otfrid were studied, partly as a practice in reading O. H. G. texts, partly in order to illustrate the differences between the various O. H. G. dialects.

3. Modern Low German authors. *Weekly through the year*. Fritz Reuter's well known short story *Ut de Franzosentied* (in the first volume of his *Olle Kamellen*) served as a specimen of modern literary Low German. The interpretation of this text gave an opportunity to touch on grammatical and etymological as well as literary questions. Reference was made to other contemporary Low German authors.

Associate Professor Kurrelmeyer gave the following graduate courses:

Middle High German (Advanced Course). *One hour weekly, second half-year*. Selections from *Kudrun* were read and interpreted.

He also gave the following undergraduate courses:

Elementary German. *Four hours weekly*. Vos, *Essentials of German*; Heyse, *L'Arrabbiata*; Betz, *Aus der Jugendzeit*; Hauff, *Das kalte Herz*.

German 5. Historical Readings. *Two hours weekly*. Hoffmann, *Historische Erzählungen*; Schiller, *Geschichte des dreissigjährigen Krieges, Drittes Buch*; Freytag, *Doktor Luther*; von Sybel, *Die Erhebung Europas gegen Napoleon I.*

German 6. Scientific Readings. *Two hours weekly*. Lassar-Cohn, *Die Chemie im täglichen Leben*; Walther, *Allgemeine Meereskunde*; Helmholtz, *Populäre Vorträge*.

Associate Professor Roulston gave the following undergraduate courses:

German 1. Modern Prose Readings and Prose Composition.

Section A. Arnold, *Einst im Mai*; Herzog, *Die Burgkinder*; Meyer, *Gustav Adolfs Page*; Meyr, *Ludwig und Anna Marie*.

Section B. Arnold, *Einst im Mai*; Storm, *Auf der Universität*; Storm, *Der Schimmelreiter*; Keller, *Romeo und Julia auf dem Dorfe*

Prose Composition (both sections): Whitney and Stroebe, *Easy German Composition*.

Private Reading (both sections): Storm, *Psyche*; Droste-Hülshoff, *Die Judenbuche*.

PUBLICATIONS

Hermann Collitz.

Der Ablaut von Got. *speiwan*. *Modern Philology*, xv, 103-107.

The Etymology of the Word *Degen*. *Johns Hopkins University Circular*, No. 296, p. 887.

The Greek Noun *σάκος*. *Ib.*, p. 887.

Ags. *seßel*, Mod. Ger. *siedeln*, Lat. *saeculum*. *Ib.*, pp. 900-902.

Das Präteritum *lie* und der Imperativ *lā*. *Mod. Lang. Notes*, xxxii, 449-458.

Early Germanic Vocalism. *Mod. Lang. Notes*, xxxiii, 321-333.

William Kurrelmeyer.

Review of O. H. Werner, *The Unmarried Mother in German Literature*, with special reference to the period 1770-1800. *Modern Language Notes*, vol. xxxii (1917), pp. 486-491.

A Fragment of an Earlier Version of *Anton Reiser*. *Modern Language Notes*, vol. xxxiii (1918), pp. 1-7.

Nachtrag zur Wieland-Bibliographie. *Modern Language Notes*, vol. xxxiii (1918), pp. 282-293.

HENRY WOOD,
Professor of German.

GREEK

SEMINARY

Advanced instruction in Greek is carried on chiefly through the medium of the Greek Seminary under the direction of Professor Miller. Since the organization of the Seminary in 1876, it has been the custom of the members to concentrate their attention in any one year on some leading author or some leading department of Greek literature. In pursuance of this custom, the principal subject of study during the past year was Plato. The members of the Seminary were required to present the results of their study and investigation in written and oral communications, and the director and members met twice a week to hear and discuss these communications. In addition to the usual exercises in textual criticism, exegesis and formal translation, the work of the Seminary embraced a special study of the *Theætetus*; reports were made on most of the Platonic dialogues;

and, with Raeder's *Platons philosophische Entwicklung* as a guide, the evolution of Platonic philosophy was systematically studied through the year.

OTHER GRADUATE COURSES

Besides directing the Seminary, Professor Miller, through the year, conducted the following weekly courses:

1. Lectures on Early Greek Philosophy designed to supplement and give further direction to the work of the Seminary.
2. Readings in Bacchylides and Pindar.
3. Interpretation of the Greek text of the Epistle to the Hebrews, the Epistle to the Romans, and the Apologies of Justin Martyr.

Professor Miller also conducted a series of weekly exercises in Greek Composition during the first half-year, and he lectured once a week on Greek Syntax during the second half-year.

Professor Robinson conducted a course of reading in Plato's *Republic* weekly through the year.

For Professor Robinson's courses in Greek Inscriptions and in Greek Archaeology, see his report on the work of the department of Classical Archaeology and Art.

UNDERGRADUATE COURSES

Until the Christmas holidays, undergraduate courses were conducted by the late Professor Spieker as follows:

1. Benner-Smyth's *Beginner's Greek Book*; Xenophon's *Anabasis*. *Three hours weekly.*
2. Homer, *Iliad*, 1. *One hour weekly.*
3. Xenophon, *Memorabilia* (selections); Plato, *Apology*; Herodotus (selections); Prose Composition. *Four hours weekly.* (Greek 1.)
4. Lysias (selections); Isocrates (selections); Euripides, *Alcestis*; Plato, *Laches*; Prose Composition. *Three hours weekly.* (Greek 3.)
5. Thucydides vii; Aristophanes, *Frogs*. *Two hours weekly.* (Two-thirds of Greek 4.)

After the Christmas holidays, owing to the protracted illness and the subsequent death of Professor Spieker, the undergraduate classes were conducted as follows:

By Professor Miller, courses 2, 4, 5, and the Prose Composition of course 3, *seven hours weekly*; but on February 1, Professor Mustard took charge of course 5 for the rest of the year, *two hours weekly*.

By Professor Robinson, the reading of course 3, *three hours weekly*.

By Mr. L. H. Baker, course 1, *three hours weekly*.

Professor Robinson gave a course in Greek Literature, *weekly through the year*. (One-third of Greek 4.)

Undergraduates read privately for examination the following:

Plato, *Crito*; Homer, *Odyssey* (two books); Lucian (selections); Demosthenes liv and iv.

PUBLICATIONS

B. L. Gildersleeve.

An Oxford Scholar. *American Journal of Philology*, xxxviii, 392-410.

Report of Revue de Philologie XL (1916). *Ibid.*, xxxix, 93-96; 211-215.

Brief Mention, *ibid.* xxxviii, 333-342; 454-460; 462; xxxix, 99-106; 220-221. Brief mention contains, among other things, notices and discussions of the following works and subjects: Thomson's *Studies in the Odyssey*; Dragoumis's *A Man of Athens*; Muretus' *Orationes*; Pindar, P. 9, 82-83; Dutton's *Studies in Greek Prepositional Phrases*; Knapp's *A Point in the Interpretation of Sophocles*; Hutton's *Thucydides and History*; Manning's *A Study of Archaism in Euripides*; Carpenter's *Ethics of Euripides*; Phoutrides' *The Chorus of Euripides*; Steadman's *The Origin of the Historical Present in English*; the *Philippics of Demosthenes*; Darkow's *The Spurious Speeches of the Lysianic Corpus*; the *Panegyricus of Isocrates*; miscellaneous notes on *Sophocles*; Pearson's edition of the *Fragments of Sophocles*; Dean West's *Value of the Classics*.

C. W. E. Miller.

Review of Cooper's *Concordance to the Works of Horace*. *American Journal of Philology*, xxxviii, 323-328.

Nihil quod tetigit non ornavit. *Ibid.*, 460-462.

Editorial work on the *American Journal of Philology*.

For Professor Robinson's publications see the report on the work of the department of Classical Art and Archæology.

C. W. E. MILLER,
Professor of Greek.

HISTORY

SEMINARY IN AMERICAN HISTORY

The Seminary in American History was conducted by Professor Latané. The work of the first half-year was devoted to early American constitutional and political history. Among the reports made were the following: "The Tariff and Sectionalism," by Kathryn L. Behrens; "Political Parties and Party Designations, 1789-1836," by Eleanor Diggs; "Federalism in Virginia," by Ernest H. Forster; "Federalism in South Carolina," by Charles C. Thach, Jr. During the second half-year the Seminary took up our relations with Latin-America and the following reports were presented: "Pan-Americanism," by Eleanor Diggs; "Disputes between the United States and Latin-American States," by Charles C. Thach, Jr.; "Good Offices and

Mediation of the United States in Disputes between American and European States," by Elizabeth Merritt; "Good Offices and Mediation of the United States in Disputes between Latin-American States," Kathryn L. Behrens.

The following lecture courses were given by Professor Latané:

1. American Constitutional and Political History, 1789-1865. *Two hours weekly, first half-year.*
2. Latin-American History and Diplomacy. *Two hours weekly, second half-year.*
3. American History, for Undergraduates (History 4). *Three hours weekly through the year.* A general course covering the whole field of American history, based on lectures, text-books, and assigned readings.
4. American Diplomacy. *Two hours weekly through the year.* Given in the College Courses for Teachers.

SEMINARY OF EUROPEAN HISTORY

Professor Vincent conducted the Seminary of European History throughout the year with investigations in the social conditions in England at the beginning of the sixteenth century. The students were brought into intimate contact with the historical materials and the forces which explain the religious revolution of this period. Out of the numerous problems of the time reports were rendered and discussed respecting The Land and the Agricultural Classes; The Privy Council in its Relation to Local Government; Education at the Close of the Fifteenth Century; The Monasteries as Agencies of Poor Relief; Conditions of Town Life illustrated by the histories of Bristol and Manchester.

The graduate lectures in European history during the first half-year were devoted to the period of the Reformation in Germany, Switzerland and England, with emphasis on political conditions and the effect of the religious controversy upon political theory and social development. During the second half-year the Puritan Revolution was traced from 1604 to 1689. This was made a study of constitutional questions with a view of bringing into prominence the great legal precedents which were established permanently during this period. Separate examinations were held for each course.

The undergraduate course known as History 3 was devoted to the general constitutional history of England. A liberal portion of the time was given to the history of the British colonial empire with a view of showing both the process by which England grew to its vast dimensions as a world power and the lessons in governmental practice to be learned from that experience. Owing to the omission of the usual classes in ancient history the students who would ordinarily have taken History 1 were admitted to this course with satisfactory results.

During the year Professor Vincent devoted much attention to the geography of the present war and prepared various articles and addresses on the problems of the international situation.

Dr. Ralph V. D. Magoffin, Associate Professor of Greek and Roman History, was absent on leave in the military service of the United States. He held a commission as captain in the Quartermaster's Department and was later given a major's commission and assigned to the General Staff.

As the result of war conditions the departmental lectures on the Albert Shaw Foundation and the public lectures on the James Schouler Foundation were both omitted.

The following dissertations in history were published in the thirty-sixth volume of the *Studies in Historical and Political Science*: "Sumptuary Law in Nürnberg," by K. R. Greenfield; "French Protestantism, 1559-1562," by C. G. Kelly.

In the series of Albert Shaw Lectures the volume on "The West Florida Controversy," by Professor Isaac J. Cox, of the University of Cincinnati, was published by the Johns Hopkins Press under the editorial supervision of Professor Latané.

A volume by Professor Latané entitled "From Isolation to Leadership, a Review of American Foreign Policy," has been completed and will be issued during the summer by Doubleday, Page and Company.

JOHN H. LATANÉ,
Professor of American History.

LATIN

The Seminary consists of the director, fellows, and such graduate students as have given satisfactory proof of their ability and training. Each year special attention is given to some one department of literature. During the session just completed the centre of work has been the Roman Satire, especially Horace and Juvenal. The members prepared papers founded upon special investigations, and presented in turn critical and exegetical commentaries upon given passages of those authors. Two meetings a week were held, through the year.

In addition to the Seminary course and the auxiliary work, Professor Smith lectured once a week through the year on the Roman Satire. Once a week for the first half-year he held a series of conferences on the *Cena Trimalchionis* of Petronius, once a week for the second half-year on the *Metamorphoses* of Apuleius, and once a week through the year he lectured on Historical Latin Syntax.

The advanced students met once a week through the year for the rapid reading of Horace, Persius, and Juvenal.

Undergraduate courses were conducted as follows:

Professor Smith:

Roman Literature (Latin III). *Weekly through the year.*

Collegiate Professor Mustard:

Latin I: Livy, bks. xxi and xxii (selections); Horace, *Odes*; Latin Composition. *Four hours weekly, through the year.*

Latin III: Vergil, *Georgics*; Horace, *Satires and Epistles*. *Two hours weekly through the year.*

Latin V: Advanced Latin Composition. *Weekly, through the year.*

During the year Professor Smith has also given addresses on the following occasions: November 16, 1917, before the Association of Colleges and Secondary Schools of the Southern States at Atlanta, Ga., on The Degree of Master of Arts at Johns Hopkins; on March 23, 1918, he gave a talk on Magic in the Actual Life of Antiquity, at St. Paul's School; on April 15, 1918, he gave an address on Italy and the War before the Society of Colonial Wars; on May 6, 1918, he gave a public reading of his poem "Numa and Egeria" at Osler Hall for the benefit of the Italian Refugees; on May 13, 1918, he gave a talk at the Second Presbyterian Church on L'Italia e la guerra.

PUBLICATIONS

Kirby Flower Smith.

Review of Cocchia's *Romanzo e realtà nella vita e nell'attività letteraria di Lucio Apuleio*. *American Journal of Philology*, xxxviii, pp. 317-318.

Review of Vespucci Reprints, Nos. 2, 4, 5, 6, and 7. *American Journal of Philology*, xxxviii, pp. 318-319.

Review of Byrne's *Prolegomena to an edition of the works of Decimus Magnus Ausonius*. *American Journal of Philology*, xxxviii, pp. 320-321.

Review of Preston's *Studies in the Diction of the Sermo Amatorius in Roman Comedy*. *American Journal of Philology*, xxxviii, p. 328.

Some Boyhood Reminiscences of a Country Town. *Johns Hopkins Alumni Magazine*, vol. vi, November, 1917, pp. 11-20.

Martial: The Epigrammatist. *The Sewanee Review*, January, 1918, pp. 1-27.

The Master's Degree at Johns Hopkins. *Johns Hopkins Alumni Magazine*, vol. vi, January, 1918, pp. 116-123; also in *Educational Review*, February, 1918, pp. 126-132.

Review of Kittredge's *A Study of Gawain and the Green Knight*. *Modern Language Notes*, xxxiii, January, 1918, pp. 45-46.

Note on Dante, *Inferno*, VIII, 7. *Modern Language Notes*, xxxiii, January, 1918, pp. 53-55.

Review of Leonard's *T. Lucretius Carus: Of the Nature of Things*, a metrical translation. *American Journal of Philology*, xxxix, pp. 81-83.

Reminiscences of an Old Johns Hopkins Student. *Johns Hopkins Alumni Magazine*, vol. vi, March, 1918, pp. 202-228.

Notice of Mustard's *The Eclogues of Faustus Andrelinus and Joannes Arnolletus*. *Johns Hopkins Alumni Magazine*, vol. vi, March, 1918, pp. 296-297.

Report of *Rivista di Filologia*, vol. 44, fasc. 3-4; vol. 45, fasc. 1-4. *American Journal of Philology*, xxxviii, pp. 330-332; pp. 452-453; xxxix, pp. 96-98.

Notice of Merrill's Lucretius. *American Journal of Philology*, xxxix, pp. 96-98.

W. P. Mustard.

The Eclogues of Faustus Andrelinus and Joannes Arnolletus, edited with Introduction and Notes. Baltimore, The Johns Hopkins Press. Pp. 123. Feb., 1918.

Notices of R. M. Gummere's translation of Seneca's Letters, vol. i; A. Gnesotto's *Francisci Barbari De Re Uxoribus Liber*; J. F. D'Alton's *Horace and His Age*; J. P. Postgate's edition of the Eighth Book of Lucan's Civil War; A. Renaudet's *Préréforme et Humanisme à Paris*. *American Journal of Philology*, vols. xxxviii-xxxix.

'Catullianum,' and 'Poliziano on the Messianic Eclogue,' *Classical Weekly*, xi, 152.

'Good old Mantuan.' *Johns Hopkins Alumni Magazine*, vi, 229-240.

Notes on Lyly's *Euphues*. *Modern Language Notes*, xxxiii, 234-43.

Later Echoes of the Greek Bucolic Poets. *American Journal of Philology*, xxxix, 193-198.

KIBBY FLOWER SMITH,

Professor of Latin.

MATHEMATICS

Professor Morley gave the following courses:

1. Higher Geometry. *Three hours weekly, first half-year.*
2. Theory of Functions. *Three hours weekly, second half-year.*
Special attention was given to the problem of elimination. After an introduction which included vector analysis and quaternions, the subject of elliptic functions was considered with some physical applications.
3. A course for graduate students of chemistry. *Two hours weekly, first half-year.*
4. The Mathematical Seminary.

Associate Professor Coble gave the following course:

Elliptic Modular Functions. *Two hours weekly through the year.*

The subject was developed from the elliptic integrals, the conormal side of the theory being emphasized.

Associate Professor Cohen gave the following course:

Elementary Theory of Functions. *Two hours weekly through the year.*

After a preliminary study of the theories of sequences and series, a study of functions of the complex variable, from both the Weierstrass and Cauchy points of view, was made.

The undergraduate courses were given by Professors Hulburt, Coble, and Cohen.

An undergraduate mathematical club was formed under the presidency of Professor Hulburt, and had several successful meetings. *The American Journal of Mathematics* is in its fortieth volume.

PUBLICATIONS

Arthur B. Coble.

Point Sets and Allied Cremona Groups. *Transactions of the American Mathematical Society*, vol. xviii, no. 3, pp. 331-372; July 1917.

Teresa Cohen.

The Cayleyan Curve of the Quartic. *Proceedings of the National Academy of Sciences*, vol. 3, pp. 447-450; July 1917.

FRANK MORLEY,
Professor of Mathematics.

ORIENTAL SEMINARY

In the Oriental Seminary, under the direction of Professor Haupt, twenty-two courses in the various departments of Oriental research were given during the past year, special attention being paid to the Old Testament and the cuneiform inscriptions bearing on the Scriptures.

Twenty-one hours during the first half-year, and twenty-two during the second, were devoted to the study of *Hebrew and the Old Testament*. In the *Old Testament Seminary*, two hours weekly, through the year, Professor Haupt gave a critical interpretation of the *Book of Lamentations*. He also conducted a series of weekly exercises in *Hebrew Prose Composition*, the students translating idiomatic English sentences into Hebrew, and lectured, weekly through the year, on *Comparative Hebrew Grammar* with special reference to the relationship between the different Semitic languages, Hebrew inscriptions, the form of Hebrew poetry, the Hebrew laryngeals and sibilants in the cognate languages, Hebrew grammarians, the origin of the Phœnician alphabet, the pronunciation of Hebrew. Dr. Blake gave a course in *Hebrew Phonology*, preceded by a sketch of the Elements of Phonetics, one hour weekly, through the year, and a course in *Hebrew Grammar*, two hours weekly, through the year. The instruction in *Elementary Hebrew* was given by Associate Professor Ember and Dr. Rabinowitz, five hours weekly, through the year; the course in *Second Year's Hebrew*, by Dr. Rabinowitz, two hours weekly through the year; and the course in *Third Year's Hebrew*, comprising a study of *Modern Hebrew Literature* and lectures on *Jewish History*, by Dr. Efros, two hours weekly through the year. Dr. Rosenau lectured, through the year, on the *Literature of the Bible* with special reference to date and authorship. Dr. Bloomhardt gave a series of lectures on *Biblical Archaeology* during the first half-year, but during the second half-year, Dr. Bloomhardt having been appointed chaplain in the U. S. Navy, the work was continued by Dr. Albright. Dr. Efros conducted a course, through the

year, on *Medieval Jewish Philosophers*, supplemented by the reading of selected Hebrew texts, and also met, weekly, during the second half-year, a class for the study of the *Mishna* and the *Talmud*.

Dr. Blake conducted, through the year, a course in *Biblical Aramaic Grammar* and the *Interpretation of the Aramaic Portions of the Book of Ezra*.

The lectures on the *History of the Ancient East* (Egypt, Babylonia, Assyria, Persia, Israel, Judah, and the minor nations of Western Asia, preceded by a sketch of the prehistoric period) were given, through the year, by Dr. Blake.

In *Arabic*, Professor Haupt conducted weekly exercises in *Arabic Prose Composition*. Associate Professor Ember gave courses in *Arabic Historians* and in *Jewish Arabic*, each one hour weekly, through the year. The instruction in *Elementary Arabic* was given by Dr. Albright, two hours weekly, through the year.

Weekly exercises in *Syriac and Ethiopic Prose Composition* were conducted, through the year, by Professor Haupt.

In *Assyriology*, Professor Haupt interpreted the fifth and sixth tablets of the *Babylonian Nimrod Epic*, and conducted a series of weekly exercises in *Assyrian and Sumerian Prose Composition*, the students translating the Hebrew text of the Book of Lamentations into Assyrian, and selected cuneiform Assyrian sentences into Sumerian. Dr. Albright gave, through the year, a course in *Cuneiform Historical Inscriptions*.

In *Egyptology*, Associate Professor Ember interpreted the *Pyramid Texts*, two hours weekly, through the year, and *Selected Hieratic Papyri*, one hour weekly, through the year.

The instructors and advanced students of the Oriental Seminary met weekly, through the year, to present new discoveries and report on important articles in the leading Oriental journals. The following original communications were presented:—Professor Haupt, Oct. 1: Heb. *masrêth hab-bôrîth*, vat of lye, Ezek. 20, 37.—Oct. 3: The Assyrian words for *apoplexy*.—Oct. 4: Heb. *kašal*, to stumble = Arab. *kasila*, to be lazy.—Oct. 11: The etymologies of the Semitic words for *gold* and *silver*.—Assyr. *çibû*, to desire, and *marû*, fat = Heb. *bart*,—Oct. 18: Assyr. *bêlu*, weapon, from *bala'*, to swallow; Assyr. *marû*, soiled = Arab. *asmar*, brown = Aram. *râmîš*, evening; Assyr. *mašâru*, body of chariot, from *šâru*, Arab. *târa*, to leap; Assyr. *el-mêšu* = Heb. *hašmal*, steel.—Oct. 25: Assyr. *šêšu* = Heb. *šêš*, rejoice; wine-press and fulling-mill; the Hebrew particle *kt*.—Nov. 1: Heb. *mas*, corvée = *maššâ*, burden, tribute; Assyr. *kudânu*, mule, from *katâmu*, to cover = Ethiop. *kadâna*, to protect; Heb. *dagan*, grain, and Syr. *gêdam*, to mow; Arab. *jadama*, *jadama*, to cut off.—The name of the month Chisleu.—Nov. 22: Arab. *lâita* = *la-hayâta 'lâhi*; Heb. *Gê-hinnôm*, Gehenna = Valley of Sleep; Heb. *Qidrôn* = Arab. *raqdah*, sleep; Heb. *šakab*, to lie down = Assyr. *sakâpu* = Arab. *bakasa*, to overthrow; Heb. *têla'â*, Lam. 3, 5, a corruption of *talpî'ôth*, siege-towers.—Dec. 6: Heb. *tôrâ*, law = Assyr. *têrtu*, intestines, omen = *tahrirtu*; Assyr. *tumru*, smoke = Heb. *timârôth* ('*ašan*) = Syr. *tinnânâ*, smoke; Heb. '*ašan*, smoke = Assyr. *irêšu*, fragrance; Heb. *tebn*, straw = *tibnâ*, building material.—Dec. 13:

Assyr. *damāqu*, to be fine = Ethiop. *damāqa*, to crush = Arab. *mādaqa* from *midāqq*, pestle, stamp, mallet.—Jan. 10: Heb. *qōq*, thorn, and *qāiq*, summer; Heb. *sir*, thorn, *še'or*, leaven, and Arab. *ša'ala*, to burn; the Topheth-gate and the etymology of *Topheth*; Assyr. *Amurru*, Mediterranean = Arab. *gamrah*, great body of water; Sodom and Gomorrah, *vanished* (Arab. *damasa*, *dasama*) and *submerged*; Melchizedek, legitimate king, not a proper name; West-Semitic names of Mount Hermon.—Jan. 17: Heb. *melk*, counsel; emendations of Is. 9, 6; Job 39, 8; Prov. 12, 26.—Jan. 24: Heb. *tōr*, *tō*, aurochs, and *šōr*, domestic ox, properly *leaper*; the four Assyrian stems *šasāfu*; Aram. *bārrā*, field = Sumer. *bar*.—Jan. 31: The etymology of Heb. *Sheol*, Hades.—Feb. 7: The Babylonian origin of the Jewish method of slaughter; Išullanu in the Nimrod epic; the three Assyrian nouns *tamirtu*.—Feb. 14: The magic food of Gilgamesh and the divine food of Elijah; English *tun* = Assyr. *dannu*, amphora, from Sumer. *dun*, to hollow out; English *barrel* = Assyr. *bāru*, urn, vat, from Sumer. *bur*.—Feb. 21: Daniel's fiery furnace a blast-furnace; Assyr. *dīqaru*, Heb. *qēderā*, pot, and *qadar*, to blacken (cf. English *crook* = pot and soot).—March 22: The original form of Psalm 110, 5.—April 12: The paronomasia in the Blessing of Gad, Gen. 49, 19.—April 26: The spiritual aspect of Zionism.—May 10: The area of Babylonia; Uz = Plain of Antioch; Heb. *ōr*, skin, and *erwā*, nakedness.—May 24: The Canaanite gloss *viābt*, he absconded = Heb. *hehbt*; Talmud. *sullām ham-miqr*, Egyptian ladder = *dargaš*, bed-steps.—Heb. *wē-gōmēr* = *wē-gōmēr igmōr et-kullō*; Assyr. *Apsā* and *Tidmat*; Aram. *hēqā* and *hānnā*, lap; Prov. 23, 4; Maccabean amulets.

Associate Professor Ember, Oct. 4: Egyptian *Nrt*, symbolized by the shuttle, and Arab. *nāra*, to weave.—Nov. 7: Eg. *bt*, grain = Assyr. *ebūru*, harvest; Eg. *hbt*, grain = Arab. *hubb*; Eg. *hbb*, jar = Arab. *hubb*; Eg. *yt*, barley, and *ywt*, to come.—Nov. 15: Eg. *wā*, garland, and Arab. *waqā*, to bind; Eg. *hms*, ear of grain, and Arab. *hasama*, to cut; Heb. *hermēs*, sickle.—Nov. 22: Eg. *ms*, to betake oneself, Arab. *māza*, to separate, Heb. *mās*, to depart; Eg. *nhy*, jaw = Heb. *lēht*; Eg. *qē*, bone, Arab. *qassa*, to lick marrow from bones.—Dec. 13: Eg. *bt*, shepherd, Arab. *badawt*, Bedouin; Eg. *nhy*, to seek = Heb. *nahā*, to lead, Arab. *nahā*, to aim at; Eg. *wād*, to worship, and Arab. *anšaba*, to chant; Eg. *mky*, to protect, and Arab. *Mecca*.—Jan. 24: Eg. *y'wt*, dignity, from *'lw*, to go up; Eg. *bhš*, to hunt = Arab. *bahāṣa*, to search; Eg. *šmr*, official title = Heb. *šōmēr*, guardian; the stem *'ny*, to turn, in Arabic.—Jan. 31: Eg. *wān*, to offer = Heb. *natan*, to give; Eg. *H'*, god of the desert = Heb. *hōl*, sand.—Feb. 7: Eg. *šd*, break = Arab. *šaṣ'a*, to split; Eg. *rdmt* = Heb. *roṭm*, broom-plant; Eg. *tnm* = Arab. *tannām*; Eg. *šm*, herbage, and Arab. *šama*, to pasture.—March 22: Eg. *hmt*, to think, and Arab. *šamaṣa*, to smell; Egyptian and Semitic etymological material in Hausa.—April 12: Eg. *mā*, to be deep or high = Heb. *maṣā*, to reach; the pronominal suffix of the second person fem. in the Hamitic languages.—April 19: Parallel phonetic changes in Egyptian and Modern Syriac; Egyptian and Semitic etymological material in Somali.—May 31: Heb. *wē-gōmēr*; the stem *ḥanan* in Egyptian.

Dr. Rosenau, Nov. 1: The centennial of Grætz's birth, Oct. 31, 1817.

Dr. Blake, May 31: Heb. *wē-gōmēr* a *Pō'al* form.

Dr. Albright, Dec. 13: Eg. *ḥḥ*, throat, and Assy. *ṣarurtu*; the origin of the Assy. ideogram for *rapāštu*, shoulder; Eg. *gs*, side, and Assy. *giššu*, body, side; Eg. *ḥnt*, nose = Heb. *ḥoīm*.—Jan. 17: The name and historicity of Abraham; two Exodi reflected in Hebrew tradition; the Egyptian name of Joseph, *The Supporter of Life*.—Jan. 31: Two cases of incomplete reduplication with subsequent dissimilation, *ṣaḥḥu* and *ṣarādu*; Assy. *ṣarḏru*, to set (sun) and Arab. *ṣarra*, to brink.—Feb. 7: Heb. *ḥamas*, to oppress = Arab. *ṣawama*, Assy. *suzṣumu*, Aram. *sēḥam*; Heb. *ḥadal*, to cease = Eg. *ḥnd*, to pass, Arab. *ṣalada*, to remain; Heb. *ṣahōr*, tawny, *ṣaḥr*, dawn, and Arab. *aḥar*, tawny; Heb. *garaṣ*, to drive = Arab. *zajara*.—March 8: Assy. *ḥittu*, burial cairn = Arab. *waḡida*, stone circle.—March 15: The Sumerian ideogram *sugur* represents the crown of a palm.—May 10: The Mandaean Rivers of Paradise; Heb.-Aram. *dalaq*, to light = Arab. *dalaqa*; Heb. *nāb*, to grow = Arab. *nāba*, to change; Assy. *ṣāzu*, to divide = Arab. *dāda*.—May 24: The episode of Aḥiṣu-namer in the Descent of Istar to Hades.

Dr. Rabinowitz, March 15: The relation of the Yemenite *Midraṣ hag-gaddōl* to the recensions of the Mishna.—April 12: Perles' *herid*, *-herid*, to mourn (Jud. 11, 37) anticipated by Jewish commentators.—April 19: The sources of the story of Isaiah's visit to Hezekiah in the *Midraṣ hag-gaddōl*.—May 10: The Jewish exegesis of *pēri 'eḡ hadār*, Lev. 23, 49.

Dr. Efros, March 8: Hebrew light on the order of the Aristotelian works extant in the 13th century.—May 24: Unrecorded Hebrew terms for the cases.—May 31: Heb. *wē-gómēr*.

At the meeting of the University Philological Association the following communications were presented by members of the Oriental Seminary: Professor Haupt, Oct. 19: Heb. *masrēth dōrith*, alkaline vat; Nov. 16: Assy. *maršu*, soiled = Arab. *asmar*, fuscous; Dec. 21: *Gehenna*; Jan. 18: Amorites, Phenicians, Philistines; Feb. 15: Sumerian words in English; May 24: Tethys and Thetis.—Associate Professor Ember, Nov. 16: Egyptian *'zm*, Asiatic = Arab; March 15: The etymology of Egyptian *'dnw*, subordinate.—Dr. Albright, Nov. 16: A new Sumerian Epic of Creation; Jan. 18: Recent progress in Egypto-Semitic philology.—Dr. Efros, April 19: *ammathī hi sēma-khāthnt*, mine arm, it upheld me, Is. 63, 5.

At the annual meeting of the Society of Biblical Literature and Exegesis, held in Philadelphia, Dec. 27-28, the following papers were presented by members of the Oriental Seminary: Professor Haupt: (a) The Harmony of the Spheres; (b) The Coronation of Zerubabel; (c) Maccabean Elegies; (d) Masora.—Dr. Albright: Historical and Mythical Elements in the Story of Joseph.—Mr. Snyder: Their worm dieth not.

On April 9 Professor Haupt gave a lecture on *Mesopotamia and Palestine* before the Anthropological Society of Washington. On April 17 he lectured on *The Historical Background of the Psalter* before the Graduate Club of Bryn Mawr College.

At the General Meeting of the American Philosophical Society, held at Philadelphia, April 18-20, he presented a paper on *The Babylonian Origin of the Jewish Method of Slaughter*.

Fourteen papers were presented by members of the Oriental Seminary at the annual meeting of the American Oriental Society, held in New Haven, April 2-4, viz., Professor Haupt: (a) Circe and Astarte; (b) Melchizedek, Legitimate King; (c) The Volcano in Engidu's Dreams; (d) Assyrian *Amurru*, Mediterranean.—Associate Professor Ember: (a) One Hundred New Semito-Egyptian Words; (b) Metathesis in Egyptian; (c) The Transliteration of Old Egyptian.—Dr. Blake: The Government Publications on the Dialects of the Igorot of the Philippine Islands.—Dr. Albright: (a) The Mouth of the Rivers; (b) Some Cruces in the Langdon Epic; (c) Some Hebrew and Assyrian Etymologies.—Dr. Rabinowitz: The General Character of the *Midrash Hag-gadol* to Leviticus.—Dr. Eiros: *The Ménorat ha-ma'ôr*, Place and Date of Composition.—Mr. Snyder: Cosmogonic Echoes in the Psalter.

The Fellow by Courtesy, Paul F. Bloomhardt, now Acting Chaplain, U. S. N., received the degree of Ph. D. on February 22. His subjects were Hebrew, Assyriology, and History of the Ancient East; the title of his dissertation was *The Book of Haggai*.

The most pressing needs of the Oriental Seminary are:

(1) the appointment of an Assyriologist to the chair of Oriental History and Archæology;

(2) a less inadequate appropriation for new books in the various departments of Oriental research, including Assyriology, Egyptology, Biblical Philology, Oriental History and Archæology, Hebrew, Talmud, Rabbinical Literature, Arabic, Persian, Turkish, Jewish Arabic, Syriac, Ethiopic, Amharic, Phenician, Sabeian, Philippine dialects, etc., etc.

PUBLICATIONS

Paul Haupt.

The Disease of King Teumann of Elam. *Journal of the Society of Oriental Research*, vol. i, pp. 88-91.

Syriac *siftâ*, lip, and *sâupâ*, end. *Journal of the Society of Oriental Research*, vol. i, p. 92.

The Retained Object. *Modern Language Notes*, vol. xxxii, pp. 405-408.

Alcohol in the Bible. *Journal of Biblical Literature*, vol. xxxvi, pp. 75-83.

Crystal-Gazing in the Old Testament. *Journal of Biblical Literature*, vol. xxxvi, pp. 84-92.

Kir = Ur of the Chaldees. *Journal of Biblical Literature*, vol. xxxvi, pp. 93-99.

Hebrew *mašâl*. *Journal of Biblical Literature*, vol. xxxvi, pp. 140-142.

Dolly and Buck-tub in Ezekiel. *Journal of Biblical Literature*, vol. xxxvi, pp. 142-145.

Mēsukkân, Acacia Nilotica. *Journal of Biblical Literature*, vol. xxxvi, pp. 145-146.

The Rose of Sharon. *Journal of Biblical Literature*, vol. xxxvi, p. 147.

- Heb. *šmš*, yesterday = Assy. *ina mšši*, at night. *Journal of Biblical Literature*, vol. xxxvi, pp. 147-148.
- The Septuagintal addition to Haggai 2, 14. *Journal of Biblical Literature*, vol. xxxvi, pp. 148-150.
- Assyr. *lānu*, aspect = Arab. *lāun*, color. *Journal of the American Oriental Society*, vol. xxxvii, pp. 253-255.
- Tones in Sumerian. *Journal of the American Oriental Society*, vol. xxxvii, pp. 309-323.
- Sumer. *gūl-gik*, obstinate refusal. *Journal of the American Oriental Society*, vol. xxxviii, pp. 66-68.
- Mesopotamia and Palestine. *Journal of the Washington Academy of Sciences*, vol. viii, No. 10, pp. 331-332.
- The Mountain-Bull. *Journal of the Society of Biblical Literature*, vol. xxxvi, pp. 249-253.
- Heb. *tš'd*, aurochs. *Journal of Biblical Literature*, vol. xxxvi, p. 254.
- Aramaic *bārrā*, wilderness = Sumerian *bar*. *Journal of Biblical Literature*, vol. xxxvi, pp. 254-255.
- šōr*, bull, and *šōrér*, foe. *Journal of Biblical Literature*, vol. xxxvi, pp. 255-256.
- štrīm*, thorns, and *štrēt*, pots. *Journal of Biblical Literature*, vol. xxxvi, pp. 256-258.
- The original meaning of Sheol. *Journal of Biblical Literature*, vol. xxxvi, p. 258.
- Tōrd* = *tahrirtu*. *Journal of Biblical Literature*, vol. xxxvi, pp. 258-259.
- Heb. *masrēth bōrith*, alkaline vat. *Johns Hopkins University Circulars*, No. 306, pp. 3-5.
- Assyr. *maršu*, soiled = Arab. *asmar*, fuscous. *Johns Hopkins University Circulars*, No. 306, pp. 7-8.
- Gehenna. *Johns Hopkins University Circulars*, No. 306, pp. 12-14.
- Amorites, Phenicians, Philistines. *Johns Hopkins University Circulars*, No. 306, pp. 21-23.
- Sumerian words in English. *Johns Hopkins University Circulars*, No. 306, p. 25.
- The Assyrian origin of *coop*. *Johns Hopkins University Circulars*, No. 306, pp. 25-26.
- Tethys and Thetis. *Johns Hopkins University Circulars*, No. 306, p. 34.
- A. Ember.
- Egyptian *'jm*, Semite = Semitic 'Arab, Arab, Bedouin. *Johns Hopkins University Circulars*, No. 306, p. 5.
- Egyptian *'idno*, subordinate, substitute. *Johns Hopkins University Circulars*, No. 306, pp. 29-31.
- F. R. Blake.
- Reduplication in Tagalog. *American Journal of Philology*, vol. xxxviii, pp. 425-431.

- Apparent Interchange between *Hê* and *Aleph* in Semitic. *Journal of the American Oriental Society*, vol. xxxv, pp. 375-377.
- The Etymology of the Aramaic particle *ith ithai*. *Journal of the American Oriental Society*, vol. xxxv, pp. 377-381.
- Multiplicative Numerals in Aramaic and Hebrew. *Journal of the American Oriental Society*, vol. xxxv, pp. 381-82.
- Mixed Constructions in Hebrew and Aramaic. *Journal of the American Oriental Society*, vol. xxxv, pp. 382-385.

W. F. Albright.

- The Home of Balaam. *Journal of the American Oriental Society*, vol. xxxv, pp. 386-390.
- The Conclusion of Esarhaddon's Broken Prism. *Journal of the American Oriental Society*, vol. xxxv, pp. 391-393.
- Some Unexplained Cuneiform Words. *Journal of the American Oriental Society*, vol. xxxv, pp. 394-398.
- The Babylonian Sage *Ut-napištim rûqu*. *Journal of the American Oriental Society*, vol. xxxviii, pp. 60-65.
- Notes on Egypto-Semitic Etymology. *American Journal of Semitic Languages*, vol. xxxiv, pp. 81-98 and pp. 215-255.
- The Solar Barks of Morning and Evening. *American Journal of Semitic Languages*, vol. xxxiv, pp. 142-143.
- The Etymology of *Se'el*. *American Journal of Semitic Languages*, vol. xxxiv, pp. 209-210.
- A New Sumerian Epic of Creation. *Johns Hopkins University Circulars*, No. 306, pp. 11-12.
- The Progress of Comparative Semito-Egyptian Philology. *Johns Hopkins University Circulars*, No. 306, p. 20.
- The Etymology of Spanish *adobe*, sun-dried brick. *Johns Hopkins University Circulars*, No. 306, p. 37.

G. S. Duncan.

- The Interpretation of the Biblical Apocalypses. *Johns Hopkins University Circulars*, No. 306, p. 32.

I. I. Efros.

- The Evolution of Modern Hebrew Literature. *Johns Hopkins University Circulars*, No. 306, pp. 23-24.
- Isaiah 63, 5. *Johns Hopkins University Circulars*, No. 306, p. 33.

PAUL HAUPT,

W. W. Spence Professor of the Semitic Languages,
and Director of the Oriental Seminary.

PHILOSOPHY

During the first half of the year Professor Lovejoy conducted seminars on Pragmatism and on The Philosophical Ideas of the Early Romantic Period, and gave a lecture course on Ethics and International Relations. These courses were discontinued on February first, Professor Lovejoy having been granted leave of absence from that date in order that he might engage in war service.

Dr. Slonimsky conducted a graduate course through the year in Kant's Ethics; undergraduate courses in Logic and Ethics, as well as one introductory to the study of metaphysics; night courses in the History of Philosophy and in Social Ethics; and summer courses in the Philosophy of Religion and in the Theory of Ethics.

ARTHUR O. LOVEJOY,

Professor of Philosophy.

PHYSICS

The Physical Laboratory has been open daily during the year for the work of advanced and undergraduate students. Regular courses of lectures have been given, and meetings have been held weekly for the reading and discussion of the current journals. The Physical Seminary has met once a week and the list of papers presented is given below.

The regular courses of instruction were as follows:

By Professor Ames:

1. Physical Seminary. *One hour weekly, through the year.*
2. General Physics. Theoretical Electricity. *Four hours weekly, through the year.*
3. Undergraduate Physics I. *Three hours weekly, through the year.*
4. Journal Meeting. *One hour weekly, through the year.*

By Professor Bliss:

1. Undergraduate Physics III: Electricity and Magnetism. *Three hours weekly, first half-year.*
2. Undergraduate Physics II: Mechanics. *Three hours weekly, second half-year.*

By Associate Professor Pfund:

1. General Physics: Electron Theory. *One hour weekly, second half-year.*
2. Undergraduate Physics II: Wave-motion. *Three hours weekly, first half-year.*
3. Undergraduate Physics III: Optics. *Three hours weekly, second half-year.*

The work in undergraduate Physics I, II and III was carried out in part by several assistants: Mr. H. L. Moore, Mr. H. L. Dryden and Mr. W. P. Angel.

The laboratory work for undergraduates has been under the direction of Professor Bliss and Dr. Pfund, with the assistance of Messrs. Moore, Dryden and Angel. The advanced work and the original investigations have been under the direction of Professors Ames and Pfund.

In the Physical Seminary papers were read as follows:

Mr. W. P. Angel—Wind Tunnel Apparatus.

Mr. G. Breit—Stability of Airplanes.

Mr. J. H. Cloud—Airplane Instruments; Wireless Apparatus.

Mr. H. L. Dryden—Series of papers upon the Physical Principles of Flight.

Mr. H. L. Moore—Wind Tunnel Experiments upon Aerofoils; Recent Advances in Meteorology.

There were four advanced students who followed Physics as their principal subject. Of these two absolved the requirements for the degree of Master of Arts, their names and the titles of their essays being as follows:

Mr. J. H. Cloud—Airplane Instruments.

Mr. H. L. Dryden—An Introduction to the Physical Principles Embodied in the Use of Airplanes.

Dr. Pfund's researches have been largely in connection with Selective Reflection in the Infra-Red from Aqueous Solutions and experiments in Photo-Electricity and in Colorimetry.

Professor Wood has been on leave of absence, having accepted a commission in the Signal Corps of the Army.

Dr. MacKenzie was granted leave of absence for the year, having accepted an appointment as Ensign in the Navy.

Professor Ames' duties as a member of the National Advisory Committee for Aeronautics were naturally more arduous owing to the existence of war. In connection with these duties he prepared several papers on the subject of Aeronautics for the committee, which were published in its Annual Report.

JOSEPH S. AMES,

Director of the Physical Laboratory.

ANIMAL PHYSIOLOGY

The staff in Animal Physiology decided to alter somewhat the character of the instruction during the season of 1917-1918. In place of a series of formal lectures it was decided to hold a series of conferences or informal exegetical lectures based upon certain assigned portions of the text-book used in the course. In these conferences questions were asked of the students and also by the students, and the points brought out were discussed briefly or at length according to their importance or difficulty. In order that these exercises might have the advantage of personal contact between the students and the teachers the class was divided into three sections, one of which reported to Dr. Howell, one to Dr. Hooker, and one to Dr. Snyder. At the end of each trimester the sections were interchanged. These recitations were supplemented during part of the year by a weekly demonstration given by Dr. Lynch. The plan worked very well in many ways and had the merit of breaking up a certain routine that had been going on for some years. In addition to this course, which during the year embraced the whole subject of physiology, as ordinarily given to medical students, the usual courses in experimental laboratory work were given, one during the fall trimester of 1917 and one during the spring trimester of 1918. Each course consisted of twelve hours of laboratory work a week for one trimester. The entire staff participated in these laboratory exercises, namely, Drs. Howell, Hooker, Snyder, and Lynch. Toward the middle of the year Dr. Lynch entered the service of the Government on the experimental side of the Gas Defense Service, and Mr. W. G. Penfield of the fourth year class in medicine supplied his place in part during the spring trimester. Dr. Hooker was given leave of absence during the winter trimester to engage in some work at the Sandy Hook Proving Grounds upon the physiological effects of air concussion in relation to shock as experienced by soldiers at the front. A report of the results obtained in these experiments has been presented to the National Research Council and a communication dealing with the same subject was read by Dr. Hooker before the National Academy of Sciences in the fall of 1918. This work was undertaken under the auspices of the Committee on Physiology of the Medical Division of the National Research Council. Dr. Howell acted as Chairman of this Committee, and also served as a member of the Executive Committee of the Medical Division of the National Research Council. In spite of the disturbances caused by war work of various kinds I am glad to say that a number of investigations were in progress during the year. Some of these have been completed and have appeared or will appear in published form; others are still in progress.

INVESTIGATIONS

Under the supervision of Dr. Howell:

1. With Emmett Holt—Two new factors in coagulation—Heparin and Proantithrombin—*American Journal of Physiology*, vol. 47, p. 328.

2. With W. G. Penfield—A study of the most efficacious solution for transfusion after severe progressive hemorrhages. In press.
3. With Miss Claire McDowell—A study of the process of activation of prothrombin to thrombin.
4. With Mr. E. C. Davidson—A study of the nervous control of the sphincters of the small intestine.
5. With Mr. Jay McLean—The use of cephalin to control hemorrhage—Work undertaken under the auspices of the National Research Council.
6. With A. R. Rich—The Mechanism Controlling the Opening of the Eustachian Tube.

Under the supervision of Dr. Hooker:

1. Dr. D. R. Hooker—Perfusion of the mammalian medulla; note on the action of ethyl alcohol—*Journal of Pharmacology and Experimental Therapeutics*, 1917, x.
2. The veno-pressor mechanism. *American Journal of Physiology*, 1918, xlii.
3. With Dr. Tsugani—Influence of inorganic salts on the Cardio-inhibitory center.

Under the supervision of Dr. Snyder:

1. Dr. C. D. Snyder—On the heat liberated by the beating heart.
1st Communication—*American Journal of Physiology*, October, 1917.
2nd Communication—*Ibid.*, September, 1918.
 2. With E. C. Andrus—On the relation between hydrogen ion concentration in the perfusing fluid and the tonicity of heart muscle of the turtle. In press.
 3. With W. de W. Andrus—Heat production in smooth muscle and heat production in the beating heart under changing conditions of internal pressure and work done by the heart.
 4. With E. C. Andrus—On the relation between hydrogen ion concentration and the tone changes of the mammalian heart.
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POLITICAL ECONOMY

The instruction in Political Economy was directed by Professor Hollander, who met students daily in seminary organization for formal study and for co-operative research. The courses were designed to afford systematic instruction in general economic principles, intimate acquaintance with special fields of economic activity, and, most important of all, knowledge of and ability to employ sound methods of economic research. Dr. George E. Barnett, Professor of Statistics, and Mr. Clare E. Griffin, Instructor in Political Economy, assisted in the conduct of the work.

Economic Seminary. The students following Political Economy as a principal subject for the degree of Doctor of Philosophy met weekly under the direction of Professors Hollander and Barnett. The work of the year centered in the investigation of representative forms of industrial development in the United States, and in the analysis of significant activities of American labor organizations. The papers and reports presented to the Seminary were as follows: "The Inflation Argument Against War Loans," by Professor Hollander; "Social Aspects of Railway Benefit Systems," by Professor Barnett; "The German Immigration Before the Civil War," by Mr. Bernhardt; "Some Aspects of Railway History in Illinois," by Mr. Griffin; "The Transportation System of Richmond," by Mr. Mitchell; "The Labor Problem of Virginia," by Mr. Seay; "German Trade Unionism in the United States up to 1880," by Mr. Bernhardt; "The Historical Evolution of the Certificates of Indebtedness as a Fiscal Device," by Professor Hollander; "The History of Economic Progress in the South," by Mr. Mitchell; "The Early Economic Progress of the South," by Mr. Mitchell; "The Proposed Legislation on Federal Employment Agencies," by Professor Barnett; "The Germans in Six American Trade Unions before 1885," by Mr. Bernhardt; "Food Legislation in Maryland in War Time," by Mr. Bernhardt; "The Investigation of the Records of the Jewish Home for Consumptives," by Mr. Bernhardt; "The Old Man in Industry," by Father O'Grady; "The Railway History of Illinois," by Mr. Griffin.

Appreciable progress has also been made by members of the Seminary in the study of special aspects of the several questions assigned for investigation. During the summer field work was carried on in various carefully selected localities, and the data thus collected have since been supplemented and corrected by documentary study and personal interview.

Professor Hollander conducted the following courses of lectures:

1. The Development of Economic Opinion. *Two hours weekly during the year.* Critical attention was given to the doctrines of the English economic writers of the first half of the eighteenth century.
2. Public Finance. *Two hours weekly during the year.* Study was made of the current financial operations of the United States with particular attention to the course of war borrowing.

Professor Barnett lectured during the year on the history of the industrial corporation and its position in modern economic life.

Professor Barnett and Mr. Griffin conducted the following undergraduate courses:

Political Economy I. *Three hours weekly, through the year.* In the first half-year the economic development of England and the industrial experience of the United States was studied. In the second half-year particular attention was given to the history of distribution and its application to leading economic problems.

Political Economy II. *Three hours weekly, through the year.* In the first half-year a preliminary study of the value and place of statistics as an instrument of investigation was made; attention was directed to the chief methods used in statistical inquiry. In the second half-year the principles of monetary science were taught with reference to practical conditions in modern systems of currency, banking and credit.

Political Economy III. *Three hours weekly, through the year.* In the first half-year the principles of insurance were taught with reference to existing systems of property, personal and social insurance. In the second half-year the history and theory of transportation were taught with particular reference to conditions in the United States.

The Johns Hopkins University will offer during the academic year 1918-19, in continuation of the courses given during the past year, a series of evening "Courses in Business Economics," under the general direction of the Department of Political Economy. Such instruction is made available at hours and under conditions designed to meet the convenience of those likely to make use thereof. While designed in the main to offer instruction to young men and women actually engaged in, or contemplating entrance into, business, industry and commerce, the courses will be planned to meet the needs, also, of those who have a more general interest in the subjects.

The Department has felt to a marked degree the interruption and disturbances of war conditions. At an early stage it was deemed proper to place all its resources at the service of the Government and to encourage the personnel, both teachers and advanced students, to assume such public tasks as, by reason of special equipment and expert qualification, they might be peculiarly fitted to perform. Thus Professor Hollander has been engaged upon a study of the effects of United States Treasury Certificates of Indebtedness in our war financing and has lately been designated by the United States Fuel Administration as Umpire under the agreement between Operators and Miners of the Maryland and Upper Potomac District. Professor Barnett has been making a study of labor and labor service under war conditions in this country and abroad, and is now serving as a labor adviser in the Emergency Fleet Corporation under the United States Shipping Board. Dr. Wolman was early granted leave of absence in order to serve as statistical expert in the Council of National Defense. Mr. Joshua Bernhardt, fellow in Political Economy, is serving in the statistical division of the United States Food Administration.

It is likely that similar conditions will obtain in the Department during the next academic year. While it is hoped to maintain the standards of scholarly interest and scientific devotion, yet it seems clear that all the energies and activities of the Department should be placed, primarily, at the disposal of the public need.

PUBLICATIONS

Jacob H. Hollander.

International Trade under Depreciated Paper: A Criticism. *Quarterly Journal of Economics*, August, 1918, pp. 674-690.

Holdings by the Banks of Treasury Certificates. *Federal Reserve Bulletin*, September, 1918, pp. 845-847.

Certificates of Indebtedness in Our War Financing. *Journal of Political Economy*, November, 1918, pp. 901-908.

War Borrowing: A Study of Treasury Certificates of the United States. The Macmillan Co., 1919 (in press).

JACOB H. HOLLANDER,
Professor of Political Economy.

POLITICAL SCIENCE

During the absence of Professor Willoughby the Seminary in Political Science was conducted by Dr. A. C. Millspaugh, and the topics considered were concerned with the fundamental principles of international law.

Dr. Millspaugh also gave a course of graduate lectures on international law, and conducted the following undergraduate courses:

1. Principles of Constitutional Government. *Three hours weekly, first half-year.*
2. Elements of International Law. *Three hours weekly, second half-year.*

In the College Courses for Teachers Dr. Millspaugh gave the following courses:

1. Comparative Government. *Two hours weekly, throughout the year.*
 2. Municipal Government and Political Parties. *Two hours weekly throughout the year.*
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ROMANCE LANGUAGES

The Department of Romance Languages underwent a complete reorganization at the beginning of the year due to the departure of three members of the former staff. Notwithstanding this change, however, it has been possible to carry on the graduate work without relinquishing in any way the standard set by the founder of the department and maintained for the last seven years by his immediate successors. There has been a good enrollment of students and the courses offered by the instructors have been well attended. Two candidates were examined for the degree of Master of Arts and both were accepted.

In the continued absence of Professor Morize, the seminary and principal courses in French literature were conducted by Professor E. P. Dargan of the University of Chicago, who was in residence from October to February. He gave the following courses:

Seminary, *two hours bi-weekly*, on Voltaire and the English Influence, treating especially of Voltaire's anglomania, his indebtedness to English philosophy and to English literature.

Eighteenth Century Ideas, *two hours weekly*. A course on the liberalizing tendencies of the century in the chief fields of literature.

Nineteenth Century Drama, *weekly*, covering the principal dramatic writers of the century, Romantic, Realistic, and contemporary.

Nineteenth Century Poetry, *weekly*, an elementary course.

Professor Brush supplemented these courses with lectures on the Classic Writers of the Seventeenth Century, given weekly during the second half-year.

Professor Blondheim conducted courses in the French Language as follows:

Seminary, *two hours fortnightly*. The subject taken up was the Old French glosses contained in the Talmudical commentaries of Rashi of Troyes. After a general study of the development of French lexicography and of the history of the Judæo-French literature, individual words were studied by the director and the students, leading to new conclusions in a number of instances. A paper presenting a summary of the work was presented by the director before the Johns Hopkins Philological Association on May 24.

Old French, *two hours weekly*. The outlines of French phonology were studied, Nyrop's *Grammaire historique de la langue française* being used as text-book. The class read Gaston Paris' *Extraits de la Chanson de Roland*; Bérout, *Roman de Tristan*; Adam le Bossu, *Le jeu de la feuille*; Colin Muset, *Chansons*; *La chastelaine de Vergi*; and Huon le Roi, *Le vair palefroi*.

Dr. Gruenbaum gave courses in Italian as follows:

Italian Historical Grammar, *two hours weekly*. Phonology and morphology, with some attention to dialects, and exercises in Italian phonetics.

Italian Classics, *weekly*. A study of Dante's Inferno.

Dr. Buceta gave courses as follows, lecturing in Spanish:

Introducción al estudio de la poesia lírica, *weekly*, taking up the beginnings and masterpieces of Spanish poetry.

La Novela, *weekly*. A course which covered the origins of the Spanish novel and its development during the golden age.

The Romance Journal Club held fortnightly meetings throughout the year, at which papers or reviews were presented by Drs. Brush, Dargan, Blondheim, Gruenbaum, Buceta, and Stewart, by Mr. Dulac, and by Misses Sturdevant, Smead, Friz, Thayer, and Miller. The Club also had the privilege of being addressed by Professor Fernand Baldensperger, of the Sorbonne and of Columbia University, on *La linguistique et la guerre*; by Professor W. A. Nitze, of the University of Chicago, on *Glastonbury and the Grail*; and by Professor T. F. Crane, of Cornell University, on *Spanish Influences on the Social Life in France in the Seventeenth Century*.

Collegiate courses were given as follows:

French Elements, two sections, *each four hours weekly*, Dr. Stewart; French 1, two sections, *each four hours weekly*, Professor Brush and Associate Professor Blondheim; French 2, *three hours weekly*, Dr. Stewart; French 3, *weekly*, and French 4, *two hours weekly*, Professor Brush; French 6, *weekly*, Associate Professor Blondheim. French 5 was not given.

Spanish Elements, *four hours weekly*, Dr. Gruenbaum; Spanish 1 and Spanish 2, *each three hours weekly*, and Spanish 3, *two hours weekly*, Dr. Buceta.

Italian 1, *three hours weekly*, Dr. Gruenbaum.

College courses for teachers were given as follows:

French 1, *three hours weekly*, Professor Sheffoe; French 2 and Conversational French, *each two hours weekly*, Dr. Gruenbaum; French 3, *two hours weekly*, Professor Brush.

Spanish 1, *two hours weekly*, Dr. Stewart; Spanish 2, Conversational Spanish, *two hours weekly*, Dr. Buceta.

PUBLICATIONS

Professor Dargan.

French Classicism and the Modern Spirit. *The Nation*, April 25, 1918, pp. 499-501.

Review of Van Tieghem's *Ossian en France and L'Année littéraire*. *Modern Language Notes*, xxxiii (1918), 357-366.

Professor Blondheim.

Tentative List of Extant Manuscripts of Rashi's Talmudical Commentaries. *Jewish Quarterly Review*, viii (1917), pp. 55-60.

Review of David H. Carnahan. The 'Ad Deum Vadit' of Jean Gerson. *Modern Language Notes*, xxxiii (1918), 111-113.

Review of W. A. Nitze and E. H. Wilkins, *A Handbook of French Phonetics*. *Modern Language Journal*, ii (1918), 335-336.

The Devil and Dr. Foster. *Modern Language Notes*, xxxiii (1918), 278-281.

Professor Brush and Dr. Gruenbaum, as co-editors of *Modern Language Notes*, have made various contributions to that journal.

MURRAY P. BRUSH,
Chairman of the Romance Language Staff.

SANSKRIT AND COMPARATIVE PHILOLOGY

Advanced work in Indic philology was carried on during the past session in two distinct domains. In the sphere of Vedic literature the Rig-Veda was treated in the regular rotation of Seminary themes. Professor Bloomfield's recent publication, 'Rig-Veda Repetitions' (Harvard Oriental Series, volumes xx and xxiv) adds a new phase to this study, because the very large number of repeated verses in the oldest document of India is a prime element in the critique of its history. The repetitions occurring in a given hymn help to determine its relative chronology, and furnish an opening for determining the inner quality and true meaning of that hymn. Selections which represent the leading aspects of the mythology and ritual of the Veda were treated with reference to a future publication in English of representative specimens of the Rig-Veda which will concern not only the primitive religion of the Aryan peoples (Hindu and Iranian), but to some extent the yet more primitive religious ideas of the Indo-European peoples as a whole.

Since the publication in 1901 thru the combined efforts of the Johns Hopkins University and the University of Tuebingen of the chromophotographic reproduction of the Kashmirian Atharva-Veda (the *Paippalāda*), Professor Le Roy C. Barret of Trinity College in Hartford (Ph. D., 1903), has been engaged in editing and elaborating, book by book, the corrupt text of that Veda. In December 1917 his critical edition of Book V appeared in the *Journal of the American Oriental Society*, vol. xxxvii, pp. 257-308.

In Classical Sanskrit advanced work concerned itself with Jaina literature. The publication in India from time to time of Sanskrit or Prakrit texts belonging to the Jaina sect of religionists is always anticipated with interest by Western scholars. Especially important are the Jaina 'Histories' (*Caritas* or *Caritras*), which are, in reality, legendary chronicles of their Saviors, Saints, Emperors, and Worthies. The recently published *Rāuhineya Carita*, a sort of thief's comedy with edificatory intent, was the subject treated in this field. Miss Helen M. Johnson, Fellow in Sanskrit, is preparing a translation with critical treatment of the *Rāuhineya*. Professor Bloomfield has in press another work in this field, 'The Life and Stories of the Jaina Savior Pārçvanātha,' the product of Seminary

work in other years, which will be published by the University Press.

A more elementary course in Classical Sanskrit, was devoted to the interpretation of the *Hitopadeṣa* and *Kathāsaritsāgara*, two of the most popular Hindu books of fiction (beast-fables and fairy tales).

The regular beginners' course in Classical Sanskrit assembled a group of students from the various philological schools of the University. This course undertakes the formal introduction to the study of Indic philology, and at the same time lays the foundation to the Comparative study of the Indo-European languages.

In Comparative Philology the work was two-fold. First the annual course of lectures on General Comparative Philology. This began with a definition of the theme and its relation to history, followed by a sketch of the history of the science. The bulk of the lectures dealt with the linguistic Ethnology of the Indo-European peoples, their divisions, special interrelations, and their original home (the so-called Aryan question). There followed sketches of the individual peoples of the family: India, the Vedas, Brahmanism, Sanskrit Literature, and Buddhism; Persia, the Achemenidan cuneiform inscriptions, the Zoroastrian Literature (*Avesta*) and religion; the minor and problematic Indo-European peoples; and, finally, similar sketches of the European peoples and their national religions.

A second course, weekly, thru the year, was devoted to the elements of Comparative Grammar of the Indo-European languages. The particular subject treated was the history of the consonants, with especial reference to Greek, Latin, Teutonic, and Sanskrit. The course was preceded by exercises in the physiological phonetics of the consonants.

MAURICE BLOOMFIELD,

Professor of Sanskrit and Comparative Philology.

ZOOLOGY, BOTANY, AND PLANT PHYSIOLOGY

1. ZOOLOGY

As in all departments of the University, the work of the Department of Zoology has been greatly altered by matters connected with the war. During the summer of 1917 Professor Jennings spent his entire time at work in the Food Administration at Washington; from October 1 to January 1 somewhat more than half his time was thus occupied; while for the rest of the year one or two days a week were spent in that work. Associate Professor Grave in January entered the military service as Captain in the Sanitary Corps. Mr. J. P. Vißcher, Graduate Assistant in Zoology, and Mr. W. H. Taliaferro, Bruce Fellow, left the University in December for service in the Sanitary Corps of the Army. In June Mr. J. G. Edwards, Graduate Assistant in Zoology, entered the service of the Signal Corps of the Army; Mr. H. S. Hopkins, second Bruce Fellow, that of the Sanitary Corps of the Army.

As a result of the absence of Professor Grave, and the resignation of Mr. Visscher, the work of Professor Andrews has been greatly increased. He continued the course in Comparative Anatomy for the remainder of the year, assisted by Mr. H. S. Hopkins in the laboratory work. At the same time the work involved in the large course in General Biology was increased, owing to the loss of one assistant.

For a portion of the year one of the laboratories of the Gas Defence Service of the Army was installed in the Biological Laboratory, under the direction of Captain Grave.

Aside from war service, other work was carried on as follows: Dr. R. W. Hegner, Assistant Professor of Zoology in the University of Michigan, now Johnston Scholar here, carried on an investigation in Heredity and Variation in one of the lower Rhizopods, *Arcella dentata*. A detailed paper presenting the results of this work is now in the hands of the publishers. Dr. Hansford McCurdy, Professor of Biology in Alma College, spending a year's leave of absence with us as Fellow by Courtesy, investigated the life history of a related organism, *Arcella vulgaris*, with particular relation to the problems of age, rejuvenescence, and related matters, as well as to heredity and variation. W. H. Taliaferro, Bruce Fellow, finished his work on reactions to light in one of the flatworms, and presented his results in the form of a dissertation for the Doctorate. Since December 14 he has been engaged, as a member of the Sanitary Corps of the Army, in the investigation of certain biological problems connected with the war, and has been stationed at Yale University. Miss Inez Coldwell investigated the cytology of the rhizopod *Diffugia corona*. Miss Bessie Noyes made an experimental investigation of the processes of hereditary differentiation in the ciliate *Stentor coeruleus*. Mr. H. S. Hopkins, second Bruce Fellow, stepped into the breach caused by the absence of Professor Grave, and conducted the laboratory work in the course in Comparative Anatomy of the Vertebrates. This compelled him to relinquish his investigation, already begun, of the conditions and results of conjugation in infusoria. In place of this he investigated certain anatomical problems in the Tunicates.

Professor Mast continued experiments, begun last year, on certain problems connected with the reproduction of the mosquito minnow, *Gambusia*, and finished two papers on reversion in the sense of orientation to light.

Professor Jennings continued, at intervals, his work on heredity, etc., in *Diffugia*. He finished a book on *Life, Death, Heredity and Evolution in Protozoa*; this is now in the hands of the publishers.

Professor Andrews found it necessary to relinquish for the present his investigations on Folliculina, owing to the increased energy required for undergraduate instruction resulting from absence of other members of the staff on war work.

In the undergraduate work in biology the war conditions are reflected in a material decrease in the number of students; in an increased proportion of younger, more immature students, and in an increased proportion of students who follow biological courses as a preparation for medicine, rather than as a culture study.

LECTURES AND CLASSROOM WORK

Biological Journal Club.—The instructors and graduate students in Zoology joined with those in Botany and Plant Physiology in a weekly club for the presentation and discussion of recent investigations in these fields.

Zoological Seminary.—The Zoological Seminary continued its reading and discussion of Radl's *Geschichte der Biologischen Theorien*. It met once a week in the evening.

The following courses were conducted by the different members of the staff:

Professor Jennings:

- Genetics. *Three lectures weekly, from October 1 to February 1.*
- Seminary in Genetics: the Problem of Sex in Lower Organisms. *Twice a week, February 1 to the end of the session.*
- Investigations in Experimental Zoology. *Throughout the year.*

Professor Andrews:

1. General Biology. *Nine hours weekly, October 1 to March 15.*
2. Embryology. *Nine hours weekly, March 15 to the end of the year.*
3. Zoology of Non-vertebrates. *Nine hours weekly, October to January.*
4. Comparative Anatomy of Vertebrates, Cytology and Embryology. *February to June (with Mr. H. S. Hopkins).*

Associate Professor Grave:

Comparative Anatomy of Vertebrates, Cytology and Embryology. *Nine hours weekly till February 1.* (From this time to the end of the year the lectures were given by Professor Andrews (see above), while the laboratory work was conducted by H. S. Hopkins).

Associate Professor Mast:

- Animal Behavior. *Three lectures or conferences and two laboratory periods weekly, throughout the year.*
- Investigation in General Physiology. *Throughout the year.*

MISCELLANEOUS

The work in Zoology continues to feel the great advantages resulting from the removal to Homewood; but also the restrictions due to our occupation of temporary quarters. Our most immediate need is a small house for cultures and the keeping of living animals. The large room employed as an undergraduate laboratory is unsatisfactory in many respects. The installation in the rooms and grounds of added aquaria and pools, and the employment of suitable additional aid in their maintenance and care, would add much to the advantages of Homewood.

The courses in Biology in the summer school were conducted by H. E. Enders (Ph. D., Johns Hopkins University), of Purdue University.

The student assistants in Zoology were Inez Coldwell, J. P. Visscher and J. G. Edwards. After the resignation of Mr. Visscher to enter the army, in December, Mr. Y. Ibara acted as assistant in the class in General Biology.

The requirements for the doctor's degree were absolved by W. H. Taliaferro.

PUBLICATIONS IN ZOOLOGY

The following list includes the publications that have appeared between July 1, 1917, and July 1, 1918:

Hegner, R. W.

The Genesis of the Organization of the Insect Egg. *American Naturalist*, vol. 51, 1917, pp. 705-718.

Singing Mice. *American Naturalist*, vol. 51, 1917, p. 704.

H. S. Jennings.

The Biology of Children in Relation to Education. In *Suggestions of Modern Science Concerning Education*, pp. 1-50. (Macmillan Co., 1917).

Disproof of a Certain Type of Theories of Crossing-over between Chromosomes. *American Naturalist*, vol. 52, 1918, pp. 247-261.

The Wheel Animalcules (Rotatoria). In *Fresh Water Biology*, pp. 553-620. (John Wiley & Sons, 1918.)

S. O. Mast.

Mutation in *Didinium nasutum*. *American Naturalist*, vol. 51, 1917, pp. 351-360.

Conjugation and Encystment in *Didinium* with Especial Reference to their Significance. *Journal of Experimental Zoology*, vol. 23, 1917, pp. 335-359.

The Vitality of Cysts of *Didinium nasutum*. *Science*, vol. 46, pp. 70-72.

Effect of chemicals on reversion in orientation to light in the colonial form *Spondylomorpha quarternarium*. *Anatomical Record*, vol. 14, p. 99.

Reversion in orientation to light in the colonial forms, *Volvox globator* and *Pandorina morum*. *Anatomical Record*, vol. 14, p. 101.

F. M. Root.

Inheritance in the Asexual Reproduction of *Centropyxis*. *Genetics*, vol. 3, pp. 173-206.

W. H. Taliaferro.

Literature for 1916 on the Behavior of the Lower Invertebrates. *Journal of Animal Behavior*, vol. 7, 1917, pp. 396-404.

Orientation to Light in *Planaria* (n. sp.) and the Function of the Eyes. *Anatomical Record*, 1917, vol. 11, pp. 524-526.

II. BOTANY

Lectures and laboratory work have been conducted as follows:

Professor Johnson:

The Physiological Anatomy of Plants. Laboratory work, conferences and demonstrations. *Six hours a week, from January to May.*

The Structure of Root, Stem and Leaf. Laboratory work, lectures and conferences. *Six hours a week, October to February. Field trips on Saturdays.*

Botanical Seminary. (The Vascular Anatomy of Plants). Lectures, conferences and demonstrations. *Two hours a week, January to May.*

Laboratory instruction and research in anatomy and reproduction of plants. *Daily, from January to May.*

JOURNAL CLUB

Botanists meet weekly in conjunction with the zoologists and plant physiologists for the discussion of current biological literature.

ADVANCED WORK

Professor Johnson was engaged, at the Harpswell Laboratory, in July, August and September, 1917, on his study of the fruits of certain Arizona cacti. A paper embodying part of the results of this study is now in press. Time available during the academic year was devoted to the writing of a botanical textbook.

Most of May and June, 1918, were spent by Professor Johnson in special service for the Bureau of Plant Industry, Washington. He was engaged in organizing and directing the work of a group of field pathologists of the Bureau, in studying the destructive diseases occurring in the grain fields of the Atlantic States from Georgia to Maine and west to West Virginia, Pennsylvania and New York.

Doctor G. A. Dunn (Fellow by Courtesy 1916-17), spent June, 1918, in the study, for the Bureau of Plant Industry, of the mould, *Rhizopus*, in its relation to the serious decay of picked strawberries, known as "leak." This investigation formed essentially an extension of researches initiated in this laboratory in the preceding academic year.

W. E. Seifriz (Student Assistant in Botany 1916-17) spent the summer of 1917 at the Harpswell Laboratory in the study of the structure of protoplasm by the aid of microdissection. Part of his results were prepared for publication after his return to Baltimore and while in military service at Camp Meade.

Mr. Seifriz began in the Botanical Laboratory in June, 1918, a study of the means of checking the decay of blackberries and raspberries during harvesting and marketing.

MILITARY SERVICE

W. E. Seifriz, Assistant in Botany 1916-17, spent most of the academic year 1917-18 in military training at Camp Meade.

L. J. Pessin, Assistant in Botany 1917-18, entered the 146th Infantry (Medical Department) in May, 1918.

PUBLICATIONS

I. F. Lewis.

The Vegetation of Shackleford Bank. North Carolina Geological and Economic Survey, Economic Paper No. 46, Raleigh 1917. (The results of an investigation initiated while Bruce Fellow of the Johns Hopkins University).

W. E. Seifriz.

Observations on the Study of the Structure of Protoplasm by the aid of Microdissection. *Biological Bulletin*, Vol. 34, 1918.

BOTANICAL GARDEN

Seeds and plants needed by the Garden and in the laboratories have been obtained as gifts from the garden of Lady Hanbury at Mortola, Italy, and from the United States Department of Agriculture, as well as by purchase from the commercial dealers. A number of plants desired for the Garden were obtained by Professor Johnson during a visit to the mountains of North Carolina in May 1918.

The labeling of native and introduced trees with map labels, indicating their geographical distribution, has proceeded during the year. The cleaning out of the woods north of the botanical Garden together with the building of walks, seats and a bridge has rendered this section of the Homewood domain more accessible and attractive. Additions have continued to be made to the nursery of valuable shrubs and trees needed for the general planting of the grounds about the university and the preparation of comprehensive plans for this planting have now been undertaken.

The attraction of the Garden for members of the University and for the steadily enlarging population of this section of Baltimore is clearly indicated by the constantly increasing number of visitors. This includes especially groups of students from the schools and colleges of Baltimore.

III. PLANT PHYSIOLOGY

ACADEMIC WORK

Course 1, for general orientation in plant physiology, was conducted in the usual manner, by Professor Livingston and Doctor Pulling, with an attendance of three. One student completed the University requirements for the Ph. D. degree and received the degree in June, 1918. From the establishment of this department, October, 1909, to June, 1918, the Ph. D. degree has been conferred on ten

students with plant physiology as principal subject; the average remains somewhat above one per year. One student completed the University requirements for plant physiology as a first subordinate subject, his principal subject being zoology. This makes a total of sixteen subordinates in this subject, completed since the opening of this department. The average for subordinates is thus somewhat over one-and-one-half per year.

RESEARCH AND RELATED ACTIVITIES

Work in research has continued throughout the year, but the relatively small number of workers, together with the decreased purchasing power of the appropriation for this work, have rendered this year's accomplishment considerably smaller than has generally been the case in previous years. We have continued to feel the increasing practical need for the solution of some of the fundamental physiological problems that underlie the arts of plant production, and most of the research work that has occupied this department during the past year has had a more or less direct bearing on agriculture. The aim has remained the same as heretofore, however; the studies of this laboratory are not primarily practical, rather do they aim to take part in the preparation of the scientific foundation for practical advance. As has been the case in previous years, a considerable portion of our attention has been directed toward the invention and perfection of methods by which the conditions that control plant growth may be measured and compared. As such methods and the interpretation of such measurements are worked out they become employed by field experimenters in other institutions, whose work is directed more primarily toward the improvement of agricultural and forestal practice.

During the summer of 1917, Doctor Pulling investigated various phases of climatic and soil conditions as these influence plant development in northern Wisconsin. Professor Livingston remained at Baltimore until September 1, completing the English edition of Palladin's *Plant Physiology* (which is now published) and assisting Mr. H. S. Fawcett and Mr. H. deForest, who spent the summer in experimental work at Baltimore. The month of September, 1917, was spent by Professor Livingston in a field trip through the Sulphur Spring and Arivaypa valleys and in the Pinaleno range of mountains above Fort Grant, Arizona. On this trip he was the guest of the Desert Laboratory of the Carnegie Institution of Washington, and of Doctor and Mrs. Forrest Shreve, of the staff of that Laboratory (both of whom are former students of the Johns Hopkins University). Mr. R. B. Espino, who is in this country on a fellowship of the University of the Philippines, spent the summer of 1917 in the plant physiology laboratory of the University of Chicago, and took up his work here October 1.

Work on the artificial control of temperature and air humidity, for plants exposed to ordinary greenhouse illumination, was temporarily discontinued for the year 1917-18, because of lack of workers. Work on atmometry and radio-atmometry has been continued through the year and standardized instruments have been furnished to a large number of investigators in various parts of the world.

Professor Livingston served as Vice-President of Section G (Botany) of the American Association for the Advancement of Science, and as chairman of the Committee on Climatic Conditions of the Ecological Society of America. He has continued as Managing Editor of *Physiological Researches* and was appointed Editor-in-Chief of *Botanical Abstracts* when that serial was founded at the Pittsburgh meetings of the botanical societies. This new journal is about to begin publication, and should be a very important factor in furthering the rapid advance of American botanical science. Professor Livingston has also served on the Botanical Committee of the National Research Council, and has represented the Committee in the Executive Committee of the Division of Agriculture, Botany, Zoology, etc., of the Council.

Professor Livingston and Dr. W. E. Tottingham (now of the University of Wisconsin) have collated and interpreted the results of some preliminary tests, made last year, on a new 3-salt solution as a nutrient medium for wheat. Two different 3-salt solutions are now known that give excellent and approximately equal growth of young wheat plants. These solutions differ as to the particular salts used and they are entirely different in regard to the proportion of the various chemical elements needed for plants. One solution contains much more potassium and nitrogen than the other, and correspondingly less calcium, magnesium, phosphorus and sulphur. The fact that they give equal growth indicates that the proportions of the essential elements are not, in themselves, a controlling condition for plant growth, and suggests that potassium and nitrogen may perhaps be saved in fertilizer practice if proper attention is given to the proportions of the other essential elements in the salt ration. This finding may be of considerable importance to agriculture, especially when potassium and nitrogen are scarce and expensive.

Professor Livingston and Mr. H. deForest have made some preliminary studies on the relation of rainfall and evaporation to what are generally known as drought periods. An instrument has been devised for studying the relative effectiveness of rainfall toward keeping the soil moist, and it appears that further studies along this line may result in quantitative measurements of the effectiveness of precipitation and of the intensity of drought. As is well known, rain-gauge records are of little value in the quantitative descriptions of climates as far as plant growth is concerned, and agriculture and forestry (as well as general ecology) require something much more suitable than the rain-gauge method.

Doctor Pulling has had charge of the laboratories and equipment and has conducted the laboratory part of Course I. He has been engaged in research along several lines, all aiming toward a better understanding of the way the environment acts to control plant growth and development. Some new principles that appear to be rather far-reaching have been worked out in regard to the dynamics of soil structure, a feature that is of great importance in agriculture and in soil science in general. He has also continued his quantitative studies on water movement in soils. On the side of the plant, Doctor Pulling has discovered some new quantitative relations between leaf-growth and stem-growth in certain pines, and he has carried out a study of the mechanical limitations of root-growth.

Mr. H. S. Fawcett was Assistant in the Laboratory of Plant Physiology during the academic year 1917-18. He has completed a very thorough study of the relations of the growth rates of certain parasitic fungi to maintained temperature, which furnished the subject of his dissertation for the Ph. D. degree, conferred in June, 1918. Certain new aspects of the temperature relation have been worked out, especially in regard to the variability, with temperature, of the temperature co-efficient for process velocities. Mr. Fawcett has made an experimental study of the problem of the alteration of growth rates with time, in the case of the fungi mentioned above, with especial reference to the possibility of an internally-developed senility, or auto-intoxication in old cultures. It appears that, with a proper maintained temperature and with a proper nutrient medium, there is absolutely no evidence to favor the supposition that the vegetative growth of these organisms may not go on indefinitely at a maintained rate. Preliminary series of tests brought out the important fact that the introduction of certain poisons or stimulants into the nutrient medium may result in altering the temperature relations of these fungi to a marked degree.

Mr. H. deForest studied the mechanics and the environmental control of the phenomenon of wilting, a phenomenon that is of considerable importance in agriculture. This problem is directly related to the one to which he gave attention during the summer, on the measurement and interpretation of drought.

Mr. R. B. Espino has devoted a large portion of the academic year 1917-18 to preliminary studies on the salt-nutrition of the rice plant during the first three or four weeks after the germination of the seed. He has substantiated the conclusion already reached by other workers, that this plant cannot thrive in a medium supplying nitrogen only as nitrate. With an ammonium salt excellent growth is obtained. Also, rice is much more sensitive to high total concentration of the nutrient solution than is wheat. This work is being continued.

Mr. E. C. Rogers made a preliminary study of the initial water-supplying power of the soil, as this is measured by methods recently devised in this laboratory. It appears that these methods may furnish approximate field measurements of this important environmental condition, so that the soil-moisture condition may be expressed by a single value, without reference to the kind of soil, to its structure or source, or to the rainfall and evaporation conditions, etc. This work promises to be very important for both agriculture and forestry. It will be continued.

THE LABORATORY OF PLANT PHYSIOLOGY

The building and equipment of this department has been in constant use throughout the entire calendar year for which this report stands. As has been remarked, our work has been limited in extent, on account of war conditions, but the summer of 1917 was a very active period in this laboratory. It seems highly desirable that this practice of utilizing the facilities throughout the entire twelve months of the year be continued. The summer months are, of course, the most valuable for many kinds of experimentation in plant physiological

research. It may become desirable, in the future, for the University to consider the recognition of summer research in this department in an academic way.

The importance of the science of plant physiology as the basis of agricultural experimentation and of agricultural practice has become still more generally recognized in the United States during the year here considered, partly because of the present approach toward what may almost amount to a world famine, and partly because of the widespread awakening of our public to the fundamental need for scientific research in general. It is, therefore, suggested that now is the time to devote as much attention as is possible to the development of this science, since the country at large is now more conscious of its great importance for human welfare than has ever been the case in the past. If funds might be provided for an increase in the volume of our research work, results of both present and permanent value might be obtained in shorter time, so that practical benefits might be derived therefrom even within the period of the present war. Aside from this practical aspect, it should be suggested that the purely scientific or philosophical activities of the United States require as much encouragement as is possible, both for the period of the war itself and for the times to follow it. It must be clearly realized that fundamental research of the type for which this University stands is perhaps the most time-consuming of all human activities; if research of a lasting character is to be carried out this can hardly be considerably hastened excepting through improved facilities and an increased number of workers. For the fulfilling of the University's task as a champion of American scientific research and for the performance of its duty to contribute as much as possible toward the national welfare, especially in these times of stress on both the practical and the scientific, it seems desirable that our work in plant physiology be pushed forward as rapidly as possible.

The needs of this Laboratory, if its work is to be accelerated, are mainly increased funds for current expenses and assistance. While the additional space that might be provided by completing the range of buildings along the south side of the Botanical Garden is one of our needs, the present building has not been crowded during the last year, and other needs are temporarily more pressing than this. It may become desirable, in another year, to consider arrangements for field experimentation, especially with reference to fertilizers and crops.

HERBERT S. JENNINGS,
Director of the Zoological Laboratory.

DUNCAN S. JOHNSON,
Director of the Botanical Laboratory.

BURTON E. LIVINGSTON,
*Director of the Laboratory of Plant
Physiology.*

REPORT OF THE DEAN OF THE COLLEGE FACULTY

TO THE PRESIDENT OF THE UNIVERSITY:

The second year of collegiate life at Homewood opened with a very good registration, only slightly below that of October, 1916. The upper classes were somewhat depleted owing to the enlistment of their members for one form or another of Government work, but the entering class largely made up for this loss in numbers. The effect of the war upon the size of the student body was felt more deeply as the year progressed, some seventeen per cent. of the students enrolled in October having left at Easter.

Despite the smaller number of students and the withdrawals, the undergraduate work was given practically as announced. In one or two cases it was necessary to consolidate courses, and owing to the enlistment of the whole teaching staff the Department of Psychology was closed. Especial emphasis was, of course, laid upon the course in Military Training, which was followed by almost every able-bodied student. This course was reorganized and made more efficient under the new commandant, and a number of those who completed the work were admitted to the Fourth Officers' Training Camp. A full quota was also sent to the Students' Training Camp at Plattsburg. In order to provide sufficient time for the theoretical work of the course, it was allowed an additional hour of lecture work from January to June, the students being relieved of a corresponding amount of work in other courses.

Owing to the departure of so many upper-classmen, the responsibilities of maintaining student activities and traditions devolved upon the few who remained. In this work they received the heartiest assistance from the under-classmen. Altogether there has been a splendid spirit of coöperation between the classes and authorities; everyone seems to have realized that to do his college work well was the best contribution he could make to the great national effort.

During the year the Board of Collegiate Studies held several meetings for the conduct of routine business and for making one or two changes in the college course and the rules and regulations which concern the administration thereof. Of the latter, the most important was the introduction of a new course preparatory to the School of Hygiene. This course, for which the admission requirements are those of the School of Engineering, covers two years and offers special training in English, mathematics, physics, chemistry, biology, drawing, and surveying, with one or two electives. Upon the completion of the course, the student is admitted to the School of Hygiene, where, after two additional years of work, he may be admitted to the degree of Bachelor of Science in Hygiene.

It was decided to list the students by classes, on the following basis: for Sophomore standing, 21 points credit; for Junior stand-

ing, 50 points; for Senior standing, 80 points. Those who have less than twenty-one points will be listed as Freshmen, or as Special Students.

Provision was made for the listing of their courses for the following year by students in residence before June 1 and by incoming students before September 25, and for the registration of all students on the first two days of the college year.

At the final meeting of the Board, it was voted to grant the degree of Bachelor of Arts *extra ordinem* to those members of the Class of 1918 who had completed three-quarters of the work required and who had been in the Government service during the past year. Similar action was taken by the Advisory Committee of the Department of Engineering. Of these men, all who were eligible by age had commissions or were then in officers' training camps, and almost every one of the others was a non-commissioned officer.

A list of the students enrolled at one time or another during the college year who entered the service is appended.

Respectfully submitted,

MURRAY P. BRUSH,
Dean of the College Faculty.

UNDERGRADUATES (1917-18) IN THE SERVICE

NAME	DEPARTMENT	SERVICE
Eli Baker	Engineering	Coast Artillery
C. H. Baxley	Engineering	2d Lt., Infantry
L. C. Beard	College	Chem. Warfare Service
K. O. Bitter	Engineering	2d Lt., Infantry
F. E. Black	Engineering	
J. W. Bowen, Jr.	Engineering	2d Lt., Field Artillery
D. B. Bratt	Engineering	2d Lt., Infantry
C. A. Bryan	College (A. B., 1918)	Infantry
R. K. Burner	College	Radio Service
E. J. Canton	Engineering (B.S., 1918)	2d Lt., Signal Corps (Radio)
G. G. Carey, Jr.	College	Lt., Canadian Flying Corps
W. K. Cromwell, Jr.	College	2d Lt., Ordnance
K. S. Cullom	Engineering	2d Lt., Engineers
F. C. Dehler	Engineering	Coast Artillery
J. L. De Marco	Engineering	2d Lt., Artillery
J. J. Downey	Engineering (B.S., 1917)	Ordnance Dept.
J. B. Eby	College (A. B., 1918)	2d Lt., Infantry
H. Ewald	Engineering (B.S., 1918)	Signal Corps (Radio)
J. P. Folkoff	Engineering	Naval Reserves
F. I. Fonaroff	Engineering (B.S., 1918)	Naval Reserves
J. W. Frisch	College	Naval Reserves
W. M. Gardner	College	2d Lt., Infantry
G. S. Harris	Engineering (B.S., 1918)	Lt., Navy
F. W. Herring	Engineering	Coast Artillery

NAME	DEPARTMENT	SERVICE
P. C. Hinrichs	College	Naval Reserves
H. H. Hopkins	Engineering (B.S., 1918)	Ordnance Dept.
E. R. Kauffman	Engineering (B.S., 1918)	Signal Corps (Radio)
L. B. Kellum	College	2d Lt., Infantry
B. L. B. Kohn	College (A. B., 1918)	Naval Reserves
J. L. Krieger	Teachers' Courses (B.S., 1918)	Sanitary Corps (Gas Div.)
J. H. Lampe	Engineering (B.S., 1918)	Signal Corps (Radio)
H. A. Lederer, Jr.	College	Naval Air Service
L. S. Levy	College (A. B., 1918)	Ordnance Dept.
L. Littman	Engineering	Coast Artillery
H. H. Mersereau	College	2d Lt., Machine Gun Service
C. H. Miegel	College (A. B., 1918)	Infantry
J. J. Miller	College (A. B., 1918)	Ensign, Naval Air Service
T. Morici	College	Sergt., Signal Corps (Meteorology)
F. V. Morley	College (A. B., 1918)	2d Lt., Coast Artillery
E. E. Murray	Engineering	2d Lt., Coast Artillery
B. S. Neuhausen	College (A. B., 1918)	Chemical Warfare Service
G. D. O'Neill	Engineering	Ordnance Dept.
S. W. Orne, Jr.	Engineering	2d Lt., Coast Artillery
J. L. Rank	College	Quartermaster's Corps
S. Rivkin	College	2d Lt., Infantry
J. S. Rosenthal	Engineering (B.S., 1918)	Ordnance Dept.
M. K. Rothschild	College (A. B., 1918)	2d Lt., Machine Gun Service
W. F. Sadtler	College	U. S. Military Academy
C. W. Schmidt	Engineering	2d Lt., Field Artillery
G. S. Shortess	College	Marine Corps
L. W. Simon	College	2d Lt., Infantry
B. W. Smith, Jr.	College	2d Lt., Coast Artillery
T. H. Spiers	College (A. B., 1918)	2d Lt., Field Artillery
J. S. Stanley	College	2d Lt., Infantry
J. L. Stearns	College	Coast Artillery
W. T. Tibbets	Engineering	2d Lt., Infantry
F. H. Townsends, Jr.	Engineering	2d Lt., Field Artillery
J. G. Vogeler	College	Naval Air Service
F. P. Weaver	Engineering	2d Lt., Air Service (Army)
A. M. Wolfe	Engineering (B.S., 1918)	Ensign, Naval Air Service
L. M. Zeskind	Engineering (B.S., 1918)	Ordnance Dept.

[Additional names and information or corrections will be welcomed.]

REPORT OF THE DIRECTOR OF THE COLLEGE COURSES FOR TEACHERS

TO THE PRESIDENT OF THE UNIVERSITY:

I have the honor to submit the following report on the work of the College Courses for Teachers, conducted in co-operation with Goucher College, during the academic year, October 8, 1917, to May 25, 1918.

This is the ninth year of these courses, the plans for which are stated in detail in the *University Circular* of July, 1917. Of the courses announced, instruction of collegiate grade was given in the following: Art I and II; Chemistry I, II, and III; Drawing; Education I, II, IV, VI, VII, and VIII; English I, II, and III; French I, II, and III; German II, III, and IV; History I and II B; History of the Ancient East, Biblical Archaeology, and Literature of the Bible; Philosophy I and II; Political Economy I and II; Political Science I and II; Spanish I and II. Owing to the small registration, the following courses announced were not given: Education III; German I; History II A; Italian; Latin; Mathematics I and II. Professor Knight Dunlap entered upon Government service at the beginning of the year, and courses Psychology I, II, and III could not be given. At the opening of the session, a course in Practical French, two hours a week, given by Dr. Gustav Gruenbaum, was organized in response to numerous requests for this type of instruction in this language. These courses were conducted by twenty-six instructors, four of whom were members of the staff of Goucher College, the remainder of the University.

The enrollment in the courses was three hundred four the first half-year, and two hundred sixty-five the second half-year, which, with the twenty-one registered in the courses given at the new University extension center, Salisbury, mentioned below, gives a total enrolment of three hundred fifty. The enrolment of three hundred twenty-nine at the University shows a decrease of one hundred seven, or twenty-five per cent., from the preceding year. This decrease is undoubtedly an effect due to war conditions. Forty-nine of these were duplicate registrations from other divisions of the University, as follows: Sixteen graduate, two medical, sixteen academic, and fifteen engineering. The primary registration of the year in the College Courses for Teachers was two hundred eighty, a decrease of one hundred thirteen, or nearly twenty-nine per cent., from the preceding year. Ninety-eight were men and two hundred thirty-one were women. Of the four hundred thirty-six students registered in the courses last year, one hundred fourteen continued their registration this year. The increase in this group of students, which is nearly twenty-five per cent. over that of last year, is gratifying and fulfills the expectations that were entertained upon the

establishment of the degree of Bachelor of Science. There were thirty graduate students among those primarily registering in these courses. In view of the drop in the total registration, it is interesting to note that these courses continue to be of service to an increasingly large number of college graduates. The amount of work accomplished by the students in these courses is best indicated by the following figures: Three students registered in eight courses, one in seven courses, three in six courses, six in five courses, eight in four courses, fourteen in three courses, forty-six in two courses, and two hundred forty-eight in one course, each. The increased amount of work undertaken by some of these students is due to the opportunities we offer whereby candidates for the degree of Bachelor of Science are able to give their full time towards meeting the requirements of this degree. There were forty-eight candidates for the degree attending the courses this year.

The occupational distribution of the persons registered continues to indicate the widening range of service which the University is offering to professional and commercial interests in our community: School officers, teachers and those in preparation for teaching, one hundred forty-seven; students, seventy-two; no occupation, sixty-two; merchants and various other business representatives, seventeen; secretaries, etc., seven; lawyers, seven; social workers and nurses, six; clergymen, two; physicians, two; insurance agents, two; a single representative of each of the following: Architect, author, engineer, musician, pharmacist.

During the session of the 1917 Summer Courses, a petition was received from several teachers in one of the counties in the State requesting that arrangements be made for giving instruction in their county, thus enabling them to attend regularly, during the year, the work accomplished in such courses to be accepted in meeting the requirements for the degree of Bachelor of Science. This petition was referred at the beginning of the academic year to the Advisory Committee on the degree of Bachelor of Science, which authorized the Director to arrange for the conduct of such University courses as would be feasible at extension centers in the State of Maryland, with credit towards the degree of Bachelor of Science.

In accordance with this authorization two classes were organized at Salisbury, Maryland, as a University extension center. Education V, by Professor E. F. Buchner, and Education VII, by Miss F. E. Bamberger, were the two courses given, with a total registration of twenty-one students. The classes met in the high school building on Thursday nights. The work in these courses proved very satisfactory and enabled these teachers to continue their studies and, at the same time, meet some of the certifying requirements of the new school law of the State. The widespread interest, manifested in various parts of the State in this new plan of extending its instruction, indicates that the University will be called upon to provide for additional courses at a number of extension centers.

The annual conference of the officers and instructors in these courses was held on June 1, 1918. The following amounts of credit for the courses were recommended and authorized: Art I, six points; Art II,

four points; Chemistry I, six points; Chemistry II, four points; Chemistry III, six points; Drawing, one point; Education I, six points (for a grade of eight or more), four points (for a grade of six or less than eight); Education II, six points (for a grade of eight or more), four points (for a grade of six or less than eight); Education IV, six points (for a grade of eight or more), four points (for a grade of six or less than eight); Education V, six points (for a grade of eight or more); four points (for a grade of six or less than eight); Education VI, six points (for a grade of eight or more); four points (for a grade of six or less than eight); Education VII, six points (for a grade of eight or more), four points (for a grade of six or less than eight), third hour on Supervision, three additional points; Education VIII, six points (for a grade of eight or more), four points (for a grade of six or less than eight); English I, six points (for a grade of eight or more), four points (for a grade of six or less than eight); English II, six points (for a grade of eight or more), four points (for a grade of six or less than eight); English III, six points; French I, eight points; French II, six points; French III, six points; Practical French, four points; German II, eight points (for a grade of eight or more), six points (for a grade of six or less than eight); German III, six points (for a grade of eight or more), four points (for a grade of six or less than eight); German IV, six points; History I, six points (for a grade of eight or more), four points (for a grade of six or less than eight); History II B, six points; History of the Ancient East, three points; Biblical Archaeology, two points; Literature of the Bible, four points; Philosophy I, six points (for a grade of eight or more), four points (for a grade of six or less than eight); Philosophy II, six points (for a grade of eight or more), four points (for a grade of six or less than eight); Political Economy I, six points; Political Economy II, six points (for a grade of eight or more), four points (for a grade of six or less than eight); Political Science I, six points (for a grade of eight or more), four points (for a grade of six or less than eight); Political Science II, six points (for a grade of eight or more), four points (for a grade of six or less than eight); Spanish I, six points; Spanish II, six points. It was voted that all credits recommended be made a matter of permanent record in the office of the Registrar.

In October, 1917, the Trustees of the University conferred the degree of Bachelor of Science upon Keener Wilson Eutsler, of Maryland, and Harry Abbott Schad, of Baltimore, who had completed the requirements during the preceding session of the Summer Courses. On February 22, 1918, the degree was conferred upon Joseph Louis Krieger, of Baltimore, who had been recently appointed as a laboratory assistant in the Medical Corps of the United States Army. On June 11, 1918, the degree was conferred upon Meyer Brown, Jacob Grape, Philena Martenet Hutton, Catherine Bowie Clagett Thomas, all of Baltimore, and Jesse Raymond Gordon, of West Virginia.

Among the graduates and former students, the following have entered the service of the United States Government:

Luis Careaga, Capt., Personnel, Division Headquarters, Camp Lee.
Howard E. Holland, 1st Lt., Assistant Camp Personnel Adjutant, Camp Upton.

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Howard E. Holland, 1st Lt., Assistant Camp Personnel Adjutant, Camp Upton.

Morton Z. Katz, Pvt., Intelligence Staff, 313th Infantry. (Killed in action, Sept., 1918.)

Joseph Louis Krieger (B. S., 1918), Pvt., Research Laboratory, Gas Defense Service, Washington.

Samuel M. North, Capt., Reconstruction work, Fort McHenry.

Elmer Vernon Roth, R. O. T. C., Norfolk, Va.

Harry F. Schneider, R. O. T. C., San Antonio, Texas.

EDWARD F. BUCHNER,
Director.

REPORT OF THE DIRECTOR OF THE SUMMER COURSES

TO THE PRESIDENT OF THE UNIVERSITY:

I have the honor to present the following report of the eighth session of the Summer Courses of the University, which was held during the six weeks from July 9 to August 16, 1918. The session was scheduled two weeks later than in the preceding year, owing to the epidemic of infantile paralysis in the autumn of 1917, which postponed the opening of educational institutions and consequently prolonged the academic year.

The co-operation of other agencies with the University in the preparation of the plans for the Summer Courses continued to be a feature of this session. The Board of School Commissioners of Baltimore located one of the city vacation schools of five classes at Homewood in order to supply a school for the purpose of demonstrations in teaching and educational investigations. They also supplied the equipment in domestic art and science and manual training, and furnished materials of instruction for the graded demonstration school. In view of having placed its entire facilities at the service of the United States Government in giving technical training to men to meet war needs, the Maryland State College of Agriculture did not undertake a summer session, but generously co-operated with the University, in connection with the State Board of Education, in providing the instructors and supervising the courses that were made available for the first time in the new department of vocational education, in the effort to supply teachers in secondary schools of the type encouraged by the Smith-Hughes Act. The department of education of the National Council and the Baltimore Council of the Boy Scouts of America and National Headquarters Girl Scouts generously provided instruction in recreation designed to prepare leadership in the recreational and other educational features of their respective fields. The Maryland Institute contributed its summer faculty and courses as the department of Fine Arts of the session. The Carnegie Foundation for International Peace again placed this university upon its list of institutions in whose summer sessions it maintained, by gift, courses in international law and practical Spanish in their relation to American and international affairs. The benefits of the survey of education in Maryland by the General Education Board continued to be apparent during this year by way of specifying the requirements which educational officials and teachers needed to fulfill, and towards which attendance on summer sessions would be of material assistance. The State Board of Education of Maryland generously delegated Mr. George H. Reavis, Assistant Superintendent of Schools, to conduct a week's conference with county superintendents at the University on certain administrative features in the State school developments. As in former years, the Peabody Conservatory continued its co-operation.

The scope of instruction offered included a total of eighty courses

in the twenty-one subjects listed below. Recreation and Vocational Education were the subjects offered for the first time. Of the courses announced, Chemistry 2, German 1, Mathematics 1, Recreation 1, Vocational Education 3, 4, 5, 6, 7, and 8, were not given.

The persons appointed to give instruction were as follows:

<i>Biology</i>	3 courses
Howard E. Enders, Instructor in Summer Courses.	
Sarah Elkin, Assistant.	
<i>Chemistry</i>	3 courses
J. Elliott Gilpin, Professor.	
William S. Hoffman, Assistant.	
<i>Economics</i>	3 courses
Clare E. Griffin, Instructor.	
<i>Education</i>	19 courses
Florence E. Bamberger, Associate.	
Anna Brochhausen, Instructor in Summer Courses.	
Edward F. Buchner, Professor.	
Jessie M. Ebaugh, Instructor in Summer Courses.	
Katharine L. Healy, Teacher in Graded Demonstration School.	
Alvey M. Isanogle, Instructor in Summer Courses.	
Buford J. Johnson, Instructor in Summer Courses.	
Helen V. McHale, Teacher in Graded Demonstration School.	
J. Hiram Shamberger, Teacher in Graded Demonstration School.	
Emma O. Sharp, Teacher in Graded Demonstration School.	
Sarah E. Simons, Instructor in Summer Courses.	
Eugene R. Smith, Instructor in Summer Courses.	
Lida E. Watkins, Teacher in Graded Demonstration School.	
David E. Weglein, Instructor.	
Effie M. Williamson, Instructor in Summer Courses.	
<i>English Composition</i>	3 courses
Robert L. Ramsay, Instructor in Summer Courses.	
John E. Uhler, Assistant.	
<i>English Literature</i>	3 courses
Robert L. Ramsay, Instructor in Summer Courses.	
John E. Uhler, Assistant.	
<i>Fine Arts</i>	6 courses
Theodore H. Pond, Instructor in Summer Courses.	
Henry A. Roben, Instructor in Summer Courses.	
Edith H. Stewart, Instructor in Summer Courses.	
<i>French</i>	3 courses
George R. Havens, Instructor in Summer Courses.	
Winifred Sturdevant, Instructor in Summer Courses.	
<i>German</i>	3 courses
Robert B. Roulston, Associate Professor.	
<i>History</i>	4 courses
Herman L. Ebeling, Instructor in Summer Courses.	
John H. Latané, Professor.	

<i>Home Economics</i>	3 courses
Blanche E. Shaffer, Instructor in Summer Courses.	
<i>Latin</i>	1 course
Herman L. Ebeling, Instructor in Summer Courses.	
<i>Manual Training</i>	3 courses
George M. Gaither, Instructor in Summer Courses.	
<i>Mathematics</i>	3 courses
Teresa Cohen.	
<i>Philosophy</i>	2 courses
Henry Slonimsky, Associate.	
<i>Politics</i>	2 courses
Arthur C. Millsbaugh, Instructor.	
<i>Psychology</i>	1 course
Buford J. Johnson, Instructor in Summer Courses.	
<i>Recreation</i>	2 courses
W. Perry Bradley, Instructor in Summer Courses.	
Dorris S. Hough, Instructor in Summer Courses.	
<i>Semitics</i>	2 courses
Frank R. Blake, Associate.	
<i>Spanish</i>	3 courses
Daniel da Cruz, Instructor in Summer Courses.	
<i>Vocational Education</i>	8 courses
Harold F. Cotterman, Instructor in Summer Courses.	
Lynn A. Emerson, Instructor in Summer Courses.	
Agnes Saunders, Instructor in Summer Courses.	

Fourteen of the instructors and assistants were members of the University. To these were added the following representatives of other institutions and school systems; Mr. W. Perry Bradley, Scout Executive, Boy Scouts of America; Principal Anna Brochhausen, of the Indianapolis Public Schools; Dean, Harold F. Cotterman, of the Maryland State College of Agriculture; Miss Jessie M. Ebaugh, of the Franklin High School, Reisterstown, Maryland; Associate Professor Herman L. Ebeling, of Goucher College; Professor Lynn A. Emerson, of the Maryland State College of Agriculture; Professor Howard E. Enders, of Purdue University; Mr. George M. Gaither, Supervisor in the Baltimore Public Schools; Dr. George R. Havens, of Indiana University; Mr. Alvey M. Isanogle, of the Thurmont High School, Maryland; Dr. Buford J. Johnson, of the Bureau of Educational Experiments, New York City; Miss Sarah Elkin, of Purdue University, *vice* Mr. Edwin J. Kohl, of Purdue University; Associate Professor Robert L. Ramsay, of the University of Missouri; Mr. Henry Roben, of the Maryland Institute of Art; Mr. Theodore H. Pond, of the Maryland Institute of Art, *vice* Mr. Carol Sax, of the Maryland Institute of Art; Miss Agnes Saunders, of the Maryland State College of Agriculture; Miss Blanche E. Shaffer, of Teachers' College, Columbia University; Miss Sarah E. Simons, Head of De-

partment of English, High Schools, the District of Columbia; Headmaster Eugene R. Smith, of the Park School, Baltimore; Miss Edith H. Stewart, of the Maryland Institute of Art; Assistant Professor Daniel da Cruz, of Miami University, *vice* Dr. Robert A. Stewart, whose absence from the session was due to illness; Miss Winifred Sturdevant, who succeeded Dr. George R. Havens when he was called to the national colors; Principal David E. Weglein, of the Western High School, Baltimore; Miss Effie M. Williamson, Primary Supervisor, Dorchester County, Maryland; and the following grade teachers, Baltimore City schools: Mr. J. Hiram Shamberger; Miss Katharine L. Healy; Miss Helen V. McHale; Mrs. Emma O. Sharp, and Miss Lida E. Watkins.

The enrollment of University students was three hundred twenty-six. Of these, one hundred three, or over 31 per cent., were men, and two hundred twenty-three, or nearly 60 per cent., were women. The total number of course registrations was seven hundred forty-seven, the average number of courses taken per student being 2.3. The distribution of these elections was as follows: One course was taken by fifty-nine students; two courses, by one hundred twenty-two; three courses, by one hundred thirty-six; and four courses, by nine, each. Two hundred nineteen, or 67.2 per cent., of the students were administrative and supervisory officers, teachers or prospective teachers in state and county systems, colleges, normal schools, public and private schools. Sixty, or 18.4 per cent., were students in colleges, normal schools and other institutions. Twenty-two, or 6.7 per cent., represented ten other occupations, and twenty-five, or 7.6 per cent., were engaged in no occupation. Eighty students held academic or professional degrees from fifty institutions. The student enrollment showed a decrease of one hundred ninety-two from the enrollment in 1917. This decrease was, in part, due to the unsettlement of conditions during war-time, in general, and to the disintegration of the teaching profession, in particular. The decrease was also due to the maintenance of three six-weeks' summer schools for white teachers by the State Board of Education, free of expense to teachers of Maryland. The instruction provided in these three schools was designed to meet the needs of elementary teachers only.

The geographical distribution of the students was as follows: Maryland was represented by two hundred seventy-five students, of whom one hundred thirty-two, or 40.5 per cent., were from the counties, and one hundred forty-three, or 43.9 per cent., from Baltimore City; twenty-one other States, the District of Columbia, China, and Japan, by fifty-one, or 15.6 per cent. Only one county in the State of Maryland failed to have a representative among the student body.

This was the fourth session which included advanced courses in its program. In spite of the well-known effect of war-time conditions to upset the continuity of the educational program of advanced students, it is interesting to note that this type of opportunity continues to attract students. The registration of graduate students was seventy-five, or 23 per cent. While there was a noticeable decrease in the number of this class of students, there was, nevertheless, a proportionate increase over the number present in the previous session.

The series of special conferences conducted by Asst. Supt. George H. Reavis, August 5 to 9, formed a part of the regular course on educational administration. The special lectures and discussions included the following topics which were considered specifically with reference to conditions obtaining in the Maryland public school system: What does an administrator need to know about scientific method in the classification, organization, and interpretation of school facts? What can we learn of a school system from an age-grade table of its pupils? How can we determine the proficiency with which teachers rate their pupils? What problems are involved in and what principles govern the classification and promotion of pupils?

The University encountered serious difficulties in making proper provision of special schools which could be in operation during the summer session. These schools are necessary for observation and demonstration purposes in meeting the needs of a large majority of summer students. In view of the provision elsewhere existing in the State to meet the needs of rural elementary teachers, the rural demonstration school, which had been successfully conducted during the last five years, was not incorporated in the plans for this session. Through the extension of its hitherto helpful co-operation with the University, the Board of School Commissioners of Baltimore provided a school at Homewood. This was accomplished by means of locating one of the three city vacation schools for white children in Gilman Hall, which was conducted under the rules of the Board as to staff of principal and teachers, grades, text-books, and other equipment. The school included grades four to eight, inclusive, and enrolled one hundred eighty-one students, ninety-six of whom were boys and eighty-five girls. The unusual attraction of Homewood for school children during the summer vacation accounted for the large number of applicants who could not be admitted owing to the limited capacity of the classrooms. The school continued in session eight weeks. Special demonstration lessons were given and facilities for observation and the conduct of mental and school tests were maintained during the first six weeks. In connection with these active participations in the life of the demonstration school, a special series of conferences was conducted on successive days, beginning July 16th and closing August 15th, as follows: Miss Williamson, arithmetic; Miss Bamberger, spelling; Miss Brochhausen, reading; Dr. Johnson, tests; Miss Williamson, home geography; Miss Brochhausen, story telling; Miss Bamberger, how to study; Mr. Smith, algebra; Miss Williamson, oral composition; Miss Brochhausen, written composition; Miss Simons, English; Mr. Isanogle, history; Miss Bamberger, project-problem method; Mr. Isanogle, nature study; Miss Brochhausen, civics; Miss Bamberger, general assembly; Miss Shaffer, domestic science; Mr. Gaither, manual training; Mr. Pond, drawing; Miss Bamberger, geography; Miss Brochhausen, dramatization; Miss Williamson, class management; Dr. Johnson, tests.

Subject and Courses	Points Credit	Enroll- ment	Number taking Examina- tions
<i>Biology</i>			
General Biology.....	4	8	8
Zoology	4	6	6
The Teaching of Botany in Secondary Schools	4	2	2
<i>Chemistry</i>			
Organic Chemistry.....	Grad.	10	9
Introduction to General Chemistry.....	4	17	11
<i>Economics</i>			
Economic History of the United States.	Grad.	9	7
Money and Banking.....	3	3	2
Elements of Economics.....	3	2	2
<i>Education</i>			
Experimental Education.....	Grad.	6	6
Educational Psychology.....	Grad.	15	12
Educational Administration.....	Grad.	6	6
Secondary School Organization and Class- room Management.....	Grad.	13	12
The Teaching of Literature in Secondary Schools	Grad.	7	5
The Teaching of English Composition in Secondary Schools.....	Grad.	14	11
The Teaching of History in Secondary Schools	Grad.	9	8
The Teaching of Latin in Secondary Schools	Grad.	8	8
The Teaching of Algebra in Secondary Schools	Grad.	9	9
The Teaching of Geometry in Secondary Schools	Grad.	8	8
Elementary Demonstration School.....	1	39	26
Elementary School Supervision.....	Grad.	9	8
School Management and School Law....	3	15	15
Grammar Grade Methods.....	3	27	27
Primary Grade Methods.....	3	35	31
The Teaching of English in the Ele- mentary School.....	3	34	31
Story Telling.....	2	17	17
The Teaching of Arithmetic and Geo- graphy in the Elementary School....	3	23	23
Rural School Problems.....	2	15	15
<i>English Composition</i>			
The Short Story.....	3	11	7
Description and Narration.....	3	6	3
Usage, Structure, and Style.....	3	15	9
<i>English Literature</i>			
Recent English Literature.....	Grad.	22	17
The Elizabethan Drama.....	Grad.	6	6
History of English Literature, 1600-1775	3	12	8

Subject and Courses	Points Credit	Enroll- ment	Number taking Examina- tions
<i>Fine Arts</i>			
Portrait Painting.....	2	6	6
Landscape and Still-Life in Oil Painting.....	2	11	11
Principles of Design.....	2	5	5
Theory and Practice of Teaching Art..	2	1	1
Elementary School Color Work.....	2	15	15
Drawing	2	11	11
<i>French</i>			
Modern French Drama.....	Grad.	9	7
Practical French.....	3	11	10
Elementary French.....	3	37	24
<i>German</i>			
Advanced Prose Composition and Prac- tical Exercises.....	Grad.	1	1
Readings in German.....	3	2	2
Elementary German.....	0	2	2
<i>History</i>			
American History since 1865.....	Grad.	11	9
Latin-American History and Diplomacy.....	Grad.	12	8
Contemporary European History.....	3	38	30
Greek History.....	3	5	5
<i>Home Economics</i>			
Nutrition and War-Time Cookery.....	3	5	5
Household Economics and Management.....	2	3	3
Textiles and Clothing.....	2	2	2
<i>Latin</i>			
Latin Literature, from Earliest Begin- nings to the End of the Second Cen- tury, A. D.....	Grad.	6	5
<i>Manual Training</i>			
Bench Work in Wood and Mechanical Drawing	3	8	8
Elementary Manual Training.....	2	9	9
The Theory and Practice of Teaching Manual Arts	3	4	4
<i>Mathematics</i>			
Analytic Geometry.....	3	3	3
Trigonometry	0	8	8
<i>Philosophy</i>			
The Theory of Ethics.....	Grad.	8	6
Philosophy of Religion.....	Grad.	16	14
<i>Politics</i>			
Problems in International Law.....	Grad.	4	3
The American Electorate.....	3	3	2

Subject and Courses	Points Credit	Enroll- ment	Number taking Examina- tions
<i>Psychology</i>	8	8	7
<i>Recreation</i>			
Recreational Leadership for Girls.....	2	10	8
<i>Semitics</i>			
Elementary Hebrew.....	Grad.	1	1
History of the Ancient East.....	Grad.	2	2
<i>Spanish</i>			
Spanish Literature.....	Grad.	2	1
Practical Spanish.....	2	4	2
Elementary Spanish.....	2	9	7
<i>Vocational Education</i>			
The Teaching of Vocational Agriculture.	2	5	5
Special Problems in Agriculture.....	2	2	2

The foregoing table records the courses which were given in the different departments and specifies the credit as graduate or collegiate, with the maximum number of points in the latter, the student enrollment, and the number completing the courses by taking the examinations. The degree of earnestness and the quality of scholarship manifested by the students were the most satisfactory that have characterized any of the sessions, although the percentage of students completing the work of the courses was slightly less than in recent years, being 83 per cent.

A special course for training in patriotic public speaking was given at Homewood under the auspices of the Maryland Council of Defense in order to place its advantages at the ready command of members of the session. This course was given by Dr. Katherine J. Gallagher, of Goucher College, and consisted of seven exercises, beginning June 18th and closing August 14th. Owing to the large enrollment of seventy, this course was conducted in two sections. On August 12, Mrs. Herbert Hoover, of Washington, Second Vice-President of the Girl Scouts, delivered an address on "The Girl Scout's War Work."

The series of Friday evening lectures and entertainments of a more popular character, Sunday afternoon organ recitals, and Wednesday afternoon art exhibits, open to the public, was made especially attractive through the cordial co-operation of the summer session of the Peabody Conservatory of Music and the Maryland Institute. The program was as follows:

July 12—Mr. J. C. Van Hulsteyn, Violinist, and Miss Vivienne Cordero, Violinist, of the Conservatory.
Recital.

- July 14—Mr. Frederick R. Huber, Organist, of the Conservatory.
Organ Recital.
- July 17—Exhibition of Students' Work of the Maryland Institute.
- July 19—Dr. W. Carson Ryan, Jr., Collector and Compiler of Statistics, United States Bureau of Education.
"National Education during the War."
- July 21—Miss Margaret P. Ingle, Organist.
Organ Recital.
- July 26—Mr. George F. Boyle, Pianist, of the Conservatory.
Recital.
- July 28—Mr. John H. Elterman, Organist.
Organ Recital.
- July 31—Exhibition from the George A. Lucas Art Collection.
- Aug. 2—Mr. Harold D. Phillips, F. R. C. O., Organist, of the Conservatory.
Recital.
- Aug. 4—Miss Ethel Davis, Organist.
Organ Recital.
- Aug. 9—Professor John H. Latané, of the University.
"The War Aims of the United States."
- Aug. 11—Mr. J. Norris Hering, Organist.
Organ Recital.

The social welfare of the members of the faculty and student body received attention. The Directors gave a reception to the two faculties at the Johns Hopkins Club, Carroll Mansion, Homewood, on Monday evening, July 8th. The University and Conservatory joined in an opening reception to the faculties and students on Friday evening, July 8, and a closing reception on Thursday evening, August 15. The former was given in the Peabody Art Gallery, and the latter in Gilman Hall, Homewood. Saturday excursions were taken to Annapolis, July 20; to Washington, upon invitation of Dr. P. P. Claxton, United States Commissioner of Education, July 28; and to Gettysburg, Pennsylvania, August 10.

EDWARD F. BUCHNER,
Director.

REPORT OF THE DEPARTMENT OF ENGINEERING

TO THE PRESIDENT OF THE UNIVERSITY:

We beg to hand you herewith the Fifth Annual Report of the Department of Engineering, for the year ending June 30, 1918:

The total enrollment of students at the opening of the year was 145. Of these 6 were graduates of other institutions, 16 were special students, 122 were candidates for the degree of Bachelor of Science in Engineering, and 1 was a candidate for a higher degree. Upon the recommendation of the Advisory Committee of the Department of Engineering and of the Board of University Studies respectively, the degree of Bachelor of Science in Engineering was conferred upon 18 students and the degree of Bachelor of Science *extra ordinem* upon 8 students, at the Commencement Exercises held on June 11, 1918. The degree *extra ordinem* was granted to those students who had entered the military or naval service after completing the studies of the third year, and had been in the service for at least one year.

The total number of scholarships awarded to students in Engineering during the year was 84. Most of these were regular scholarships in the Department of Engineering. A complete list of holders of scholarships of the several types is given at the end of this report.

The Night Courses for Technical Workers, which were inaugurated in 1916, were continued during the year with increased attendance. Instruction was given by members of the University Staff, assisted by Mr. J. B. Arthur, of the United States Naval Academy. A full report on these courses will be found under the report of the Night Courses for Technical Workers. These classes and those of the Evening Courses in Business Economics were held in the Engineering Buildings.

At the request of the War Department, a course in Radio Communication was opened and this was attended by fourteen of the senior engineering students. The purpose of this course was to prepare them for commissions in the Signal Corps. Eight of the students of this course entered the Signal Corps and with one exception have since been commissioned. A number of other students also entered other branches of the military and naval service and have received commissions.

A demand arose in Baltimore during the winter for some preliminary training for men about to enter the Aviation Service. To meet this demand, Professors Christie and Kouwenhoven organized a course of lectures and laboratory practice in the evening which was given to two separate classes, totaling over 100 men. Instruction was offered in Radio Communication, Internal Combustion Engines,

Theory of Flight, Meteorology, Ignition Systems and Military Law. The course was a decided success, both as regards attendance and results obtained. In addition to Professors Christie and Kouwenhoven, lectures and instruction were given by Captain Guild and Messrs. Dana and Pullen, of the Engineering Staff, and also by Drs. Pfund and Reid, of the University Faculty.

Through the generosity of Mr. J. E. Aldred, there has been donated to the Department, for several years, a fund for furthering and improving undergraduate instruction in the methods and problems of the practice of engineering. The principal feature in the use of this fund has been a course of lectures, a full account of which is given in a later part of this report. A portion of the fund has also been used to enable the members of the Faculty and Senior students to make inspection trips to engineering works of magnitude, and also to attend meetings and conventions of Engineering Societies. In April, 1918, the Senior class and several members of the teaching staff made an inspection trip to Pittsburgh, visiting various industrial establishments. The plants visited were the following: Westinghouse Air Brake Company, Westinghouse Electric and Manufacturing Company, National Tube Company, McKeesport Tin Plate Company, American Bridge Company, Standard Underground Cable Company and Carnegie Technical Schools. The students were greatly benefited by this chance to observe practical industrial operations and processes. Other visits of inspection, to plants in the vicinity of Baltimore, have been made during the year.

The Reserve Officers' Training Corps, which had been established in the Fall of 1916, was considerably increased in size as a result of this country's entry into the war. Captain George R. Guild, U. S. Army, retired, became Commandant of the Corps and Professor of Military Science and Tactics in the University, in September, 1917. Captain Guild was made a member of the Engineering Faculty, and appointed also to membership on the Advisory Committee of the Department. Several members of the Engineering Faculty, who had had some military training and experience, volunteered their services as aids to Captain Guild, and took an active part in training the Battalion, both in classroom and field. Professor Tilden (who was commissioned Captain of Engineers in the Reserve Corps of the Army in February, 1917) was appointed Assistant Commandant of the Battalion, and Professors Christie, Jones, Kouwenhoven and Bringhurst were made assistant instructors with the rank of Captain R. O. T. C., under the provisions of General Orders 49, W. D. 1916. The cadet officers of the Battalion were almost entirely made up of upper class students in the Department of Engineering.

Miss Louise Talbot, Research Assistant in Mechanical Engineering, resigned at the close of the year to accept a position with the Baltimore Copper Works as Industrial Chemist.

Following is a statement of the activities and courses which were given during the year in each of the branches of Engineering.

ELECTRICAL ENGINEERING

The Laboratory of Electrical Engineering has been open daily throughout the year, and lectures and laboratory work have been conducted as follows:

Advanced Courses

Seminary and Journal Meeting. *One hour weekly through the year.* Dr. Kouwenhoven.

Undergraduate Courses

Electrical Engineering 1. Electrical Theory and Direct Current Machinery. *Four hours weekly through the year.* Dr. Kouwenhoven and Mr. Pullen.

Electrical Engineering 2. Electrical Measurements, Railways and Illumination. *Three hours weekly through the first half-year.* Mr. Pullen and Mr. Lieberknecht.

Electrical Engineering 3. Alternating Current Theory. *Three hours weekly through the year.* Dr. Kouwenhoven and Mr. Lieberknecht.

Radio Communication. The Theory and Practice of the Art of Communication as used by the Signal Corps, United States Army. *Ten hours weekly through the second half of the year.* Dr. Kouwenhoven and Mr. Lieberknecht.

The Seminary and Journal Meeting has met weekly through the year for review of current journals.

During the summer of 1917 Professor Whitehead undertook for the Naval Consulting Board an experimental investigation of an important war problem. At the request of the Board, in order that this work might be continued, Professor Whitehead was granted leave of absence by the Trustees for the following academic year. Much of the experimental work was conducted in the Laboratory of Electrical Engineering. The modern equipment of the laboratories aided greatly in the rapid prosecution of the work. Dr. Kouwenhoven rendered valuable assistance during the early stages.

Professor Whitehead was commissioned June 23, 1917, Major, Engineers, U. S. R., ordered to active duty January 12, 1918, and assigned to the Naval Consulting Board for continuance of the special experimental investigation referred to above.

Professor Whitehead was awarded the Edward Longstreth Medal of Merit by the Franklin Institute of Philadelphia.

Professor Whitehead delivered a lecture on "The Measurement of High Alternating Current Voltages" before the Brooklyn Institute of Arts and Sciences on December 12, 1917.

Dr. Kouwenhoven published a paper on "A Solution for an Acceptance Test Problem" in the *Electrical World* on January 19, 1918. The material for this paper was obtained from an investigation of the characteristics of the generators in the University power-house.

Dr. Kouwenhoven attended the course for teachers given by the Westinghouse Electric and Manufacturing Company during the summer of 1917 and remained with that company until called by the Naval Consulting Board to aid them in one of their investigations. He was appointed Consulting Electrical Engineer to the Bureau of Standards, Washington, D. C., on May 3, 1918.

During the year Professor Kouwenhoven and Mr. Lieberknecht aided two of the industrial plants of Baltimore in solving manufacturing problems and in determining the characteristics of some of their products. The results of these investigations were very valuable to the industrial plants for which they were made. Professor Kouwenhoven and Mr. Lieberknecht also used the electrical standards of the University for checking a number of electrical instruments for various Baltimore concerns. It is to be hoped that this work will grow and that the standards of the University will be used by other Baltimore firms.

Mr. Lieberknecht was engaged in an experimental study of the electric strength of various gases other than air.

The Baltimore Section of the American Institute of Electrical Engineers, of which Professor Whitehead is Chairman, has held its monthly meetings in the Electrical and Mechanical Engineering Building.

A number of trips of inspection of electrical engineering plants and projects have been taken by the advanced classes, in charge of members of the Faculty, the most noteworthy being visits to the Pittsburgh plants, which have already been mentioned. Other plants visited were the Pennsylvania Water & Power Company's plant at Holtwood, Pa., the Westport Station of the Consolidated Gas Electric Light & Power Company, and the Sparrows Point plant of the Bethlehem Steel Company.

MECHANICAL ENGINEERING

Advanced Courses

Materials and Machines—Manufacture and Properties of Engineering Materials. *Two hours weekly second half-year.* Associate Professor Christie and Mr. Smallwood.

Undergraduate Courses

Mechanical Engineering 1. Thermodynamics of Power Production. *Four hours weekly through the year and one afternoon per week of laboratory.* Mr. Smallwood and Mr. Dana.

Mechanical Engineering 2. Power Plant Equipment and Design. *Three hours weekly through the year.* Associate Professor Christie.

Mechanical Engineering 3. Design of Machine Parts and Calculation of Stresses. *Three hours weekly through the year and two afternoons per week of drawing.* Mr. Smallwood.

Mechanical Engineering 4. Heat Engineering Laboratory. *Two afternoons per week through the year.* Associate Professor Christie.

Mechanical Engineering 5. Industrial Organization. *One hour weekly through the year.* Associate Professor Christie.

Kinematics of Machinery. *Four hours weekly through the year.* Mr. Dana.

During the summer of 1917 Professor Thomas was selected by the United States Shipping Board to organize and direct new schools on the Atlantic Coast to train men in Navigation and Marine Engineering. One of such schools was started at this University and the facilities of the Department of Engineering were placed at the disposal of the Shipping Board. Messrs. Smallwood, Dana, McCleary and Skrivan, of the University, did part of the teaching in the first courses. When the regular University work commenced, instruction was also given by Messrs. Lyons and Russell, of the Naval Academy.

Professor Thomas was granted leave of absence in October to become Manager of the Machinery Fabrication Department of the American International Shipbuilding Corporation at Hog Island, Pa. Mr. J. W. Lindau took charge of the U. S. Shipping Board Schools after Professor Thomas left the University. The schools have been remarkably successful. The men must have had some engineering or sea experience before being admitted to the school and their applications had to be approved by the Government authorities. Students were given plain, practical instruction rather than advanced theory in six weeks' courses on Marine Engineering or on Navigation. Both day and night classes were held, the latter having the larger attendance. The laboratories of the University were utilized for the practical instruction. The first class opened July 16, 1917, and during the year nine classes were held. The largest single class was in Marine Engineering and had 98 men. 766 men have enrolled in these courses, of whom 200 have secured their licenses. The remaining men are getting their sea service as required by law.

Professor Thomas presented a paper on "The Cooling of Water for Power Plant Purposes" at the December meeting of the American Society of Mechanical Engineers, New York. This covered the results of several years tests on the spray pond at the University.

Professor Christie spent the summer of 1917 as Chief Draftsman for F. R. Weller, Consulting Engineer at Washington, on power plant design for the Bureau of Yards and Docks, Navy Department.

Professor Christie took a very active part in the Fuel Saving Campaign in Baltimore during the past winter and published a number of articles on this subject. He also continued his work on Public Utilities and contributed a paper on "Shall Municipalities Own Their Utilities?" to the August number of the *Engineering Magazine*.

Professor Christie spent some time during the past spring studying special educational problems for the Emergency Fleet Corporation.

Mr. Smallwood was Consulting Engineer for the Gibbs Preserving Company during the summer of 1917, directing improvements in their plant. He has continued his investigations of the canning industry throughout the year and has secured some interesting results. These were presented in a paper on "Investigations of the Uses of Steam in the Canning Industry," presented at the Spring Meeting of the American Society of Mechanical Engineers. During the year Mr. Smallwood published the second edition of "Mechanical Laboratory Methods," a book very widely used in technical schools.

Mechanical Engineering students were taken on a number of inspection trips during the year. Besides the Pittsburgh trip already

mentioned, visits were made to the following plants: Westport Station, Consolidated Gas Electric Light & Power Company; Sparrows Point Plant, Bethlehem Steel Company; A. Weiskittel & Son; American Ice Company and some others.

CIVIL ENGINEERING

Advanced Courses

Seminary and Journal Meeting. *One hour weekly, second half-year.* Professor Tilden, Associate Professor Jones and Mr. Bringhurst.

Undergraduate Courses

Civil Engineering 1. Theory of the Strength of Materials and Elements of Structural Design. *Three lectures or recitation hours, and four hours of drafting room or laboratory work, weekly through the year.* Professor Tilden.

Civil Engineering 2. Theory of Structures and Design. *Three lectures or recitation hours, and six hours of drafting room or field work, weekly through the year.* Mr. Bringhurst.

Civil Engineering 3. Elements of Sanitary Engineering. *Three lectures or recitation hours and six hours of drafting room or laboratory work, weekly through the year.* Associate Professor Jones.

Civil Engineering 4. Transportation (Elective). *Two lectures or recitation hours, and three hours in drafting room or field, weekly through the year.* Professor Tilden (Railways and Canals), Associate Professor Jones (Highways).

Civil Engineering 5. Advanced Surveying (Elective). *One lecture or recitation hour and four hours in drafting room or field, weekly through the first half-year.* Mr. Bringhurst.

Civil Engineering 6. Military Topography and Map Reading (Elective). *One lecture or recitation hour and four hours in drafting room or field, weekly through the second half-year.* Mr. Bringhurst.

Engineering Drawing. Lettering, Orthographic and Isometric Projection. *Four hours in drafting room, weekly first half-year.*

The usual Surveying course was omitted in June, 1918, on account of the great demand for student labor by the Government and the United States Shipping Board Emergency Fleet Corporation, and the opening of the Reserve Officers' Training Corps Camp at Plattsburg.

Excursions have been made by the Senior class in Civil Engineering to points of engineering interest near Baltimore, and to Pittsburgh, as noted above.

Professors Tilden, Jones and Bringhurst attended the Annual Meeting of the American Society of Civil Engineers in New York in January.

Associate Professor Jones attended the Convention of the American Water Works Association in St. Louis in May, 1918, and also the "War Meeting" of the American Public Health Association, in Washington, D. C., in October, 1917.

Professor Tilden was Executive Secretary of the General Engineering Section of the Advisory Commission, Council of National Defense, from June 1, 1917, until the dissolution of that committee in April, 1918. In May, 1918, he began work for the United States Shipping Board Emergency Fleet Corporation, as Special Agent in the Department of Education and Training, and immediately on the closing of the University in June, left for Seattle and Portland, where he had charge as District Representative of Education and Training of the establishment of systems of training in the Government shipyards of the Puget Sound and Columbia River Districts.

Mr. Frank L. Weaver, Instructor in Civil Engineering, received his commission as First Lieutenant in the Engineer Reserve Corps of the Army and was ordered to the 305th Regiment of Engineers.

At the request of certain reserve officers of the Army, in training at Fort Howard, Mr. Bringham delivered two lectures on the general subject of Surveying, in November and December. These were given at the Fort and were well attended.

Professor Tilden was made Executive Secretary of the Homewood Development committee, which has charge of the development of the University grounds at Homewood. In connection with the routine work of the committee, Professor Bringham has done a considerable amount of surveying, making use largely of student labor as assistants.

In May, 1918, Professor Bringham undertook at the request of the Topographical Survey Commission of Baltimore City the primary triangulation work necessary as a basis for the survey of the addition to the area of the city. Professor Jones has also been engaged in this work.

THE J. E. ALDRED LECTURES ON ENGINEERING PRACTICE

A series of nine lectures on the above subject was delivered by engineers engaged in the practice of the profession. In accordance with the wish of Mr. Aldred, particular stress was laid in arranging these lectures that they should deal with practical phases of engineering problems, rather than with underlying theory, or new and striking applications. The lectures were as follows:

January 16. "Steam-Electric Power Plant Design." Mr. A. S. Loizeaux, Electrical Engineer, Consolidated Gas Electric Light and Power Company, of Baltimore.

January 30. "The Relation Between Civil Engineering and Military Engineering." Major-General William M. Black, Chief of Engineers, U. S. A., Washington, D. C.

February 13. "The Development of Concrete Road Construction." Mr. Arthur N. Johnson, Consulting Highway Engineer, Portland Cement Association, Chicago, Illinois.

February 20. "Copper Refining." Mr. Edwin Wells Rouse, Jr., Assistant Superintendent, Baltimore Copper Smelting and Rolling Company, Baltimore.

February 27. "The Coal Problem." Mr. E. G. Bailey, President, Bailey Meter Company, Boston, Mass.

March 6. "The Growth of Electric Systems." Mr. Julian C. Smith, Vice-President, Shawinigan Water and Power Company, Montreal, Canada.

March 13. "The Operation of a Manufacturing Plant." Mr. Ralph E. Thompson, Superintendent, Gillette Safety Razor Company, Boston, Massachusetts.

March 27. "The Control of Stream Pollution." Mr. Earle B. Phelps, Hygienic Laboratory, American Public Health Service, Washington, D. C.

NIGHT COURSES FOR TECHNICAL WORKERS

Mathematics (N). Plane Trigonometry and Analytic Geometry. *Monday and Thursday evenings*, 8 to 10. Dr. L. S. Hulburt.

Chemistry 1 (N). General Inorganic Chemistry. *Lecture on Monday evening*, 8 to 10, *and laboratory on Friday evening*, 8 to 10. Dr. J. E. Gilpin, Dr. E. Miller and assistants.

Chemistry 2 (N). Qualitative and Quantitative Analysis. *Tuesday and Friday evenings*, 8 to 10. Dr. J. E. Gilpin, Dr. E. Miller and assistants.

Civil Engineering 1-N. Theory of Strength of Materials and Elements of Structural Design. *Monday and Wednesday evenings*, 7:30 to 9:30. Professor C. J. Tilden and Mr. J. H. Bringham.

Civil Engineering 2-N. Advanced course in Structural Design. *Monday and Wednesday evenings*, 7:30 to 9:30. Mr. J. H. Bringham.

Civil Engineering 3-N. Sanitary Engineering and Water Analysis. *Tuesday and Thursday evenings*, 7:30 to 9:30. Prof. G. R. Jones.

Electrical Engineering 1-N. Elements of Electricity and Magnetism and Direct Current Machinery. *Monday and Thursday evenings*, 7:30 to 9:30. Mr. J. B. Arthur.

Electrical Engineering 2-N. Elementary Alternating Currents. *Tuesday and Friday evenings*, 7:30 to 9:30. Mr. J. B. Arthur.

Electrical Engineering 3-N. Advanced Alternating Currents. *Tuesday and Friday evenings*, 7:30 to 9:30. Mr. F. W. Lieberknecht.

Mechanical Engineering 1-N. Elements of Machine Design. *Monday and Thursday evenings*, 7:30 to 9:30. Messrs. J. C. Smallwood and W. J. Dana.

Mechanical Engineering 2-N. Heat Engines. *Tuesday and Friday evenings*, 7:30 to 9:30. Mr. J. C. Smallwood.

Mechanical Engineering 3-N. Power Plant Design. *Monday and Thursday evenings*, 8 to 10. Prof. A. G. Christie.

The Night Courses for Technical Workers were started in 1916 with no definite information as to the class of students who would attend or the possibilities of each course. The first years' experience enabled the Engineering Staff to formulate rather definite ideas regarding the class of students who would probably attend and the preparation that might reasonably be expected of these students. The Mathematics course was added to give students the mathematical training required in later technical courses. As a result of the application of these ideas, it was found that the night students during the past year were on the whole better prepared and advanced further in their work than the classes of the first year.

215 students registered in the above courses in the fall. During the first term there were a large number of withdrawals. A study of these withdrawals showed that in practically every case the student had either been drafted, had entered Government service, or had taken up work in an essential industry in another locality. 150 students entered the second term of these courses. Several students came from some distance out of town to take the evening work.

One very encouraging feature of the year's work was the large number of students of the 1916-17 classes who returned last fall for further instruction. The Night School has been very heartily supported by the manufacturers and business men of Baltimore and appears to fill a decided need in the industrial life of the city. It has operated under a very serious handicap during the past year due to war conditions. The return of peace should cause a great increase in the sizes of these Night Classes and also an extension of their number and scope. Plans are well advanced to take care of such conditions.

The facilities of the laboratories have been used by some of the evening course men who are properly qualified for carrying on research work in which they were interested. Several of the members of the course in Electrical Engineering 3-N availed themselves of this opportunity during the past year and it is to be hoped that this practice will grow.

The Night School for Technical Workers was a decidedly new departure for this University when established two years ago. But it has already more than justified itself as a means of placing the facilities of the University and its laboratories at the service of the community, and particularly of industrial Baltimore.

C. C. THOMAS,
C. J. TILDEN,
J. B. WHITEHEAD, *Secretary*.

SCHOLARSHIPS IN THE DEPARTMENT OF ENGINEERING

Scholarships were held during the year 1917-18 by the following persons:

SCHOLARSHIPS IN THE DEPARTMENT OF ENGINEERING
CREATED BY ACT OF THE LEGISLATURE, 1912.

To Graduates of Maryland Colleges

Eugene F. Baldwin (A. B., Loyola College).
John L. DeMarco (S. B., St. Johns' College).
Anthony R. Spartana (A. B., Rock Hill College).
Oliver P. Winslow (S. B., St. John's College).

To Residents of Baltimore City and the Counties

Karl H. Andrae, of Baltimore County. [At large]
Frank Applestein, of Baltimore (First District).
Wilbur L. Armstrong, of Prince George's County.
E. Stanley Ault, of Baltimore (Second District).
Wilmot C. Ball, of Baltimore (Second District).
Kenneth O. Bitter, of Baltimore County.
Frank E. Black, of Baltimore (Third District).
Harry E. Bloomsburg, of Baltimore (Fourth District). [Senatorial]
Daniel B. Bratt, of Talbot County. [Senatorial]
Wallace E. Brimer, of Worcester County.
Lewis W. Call, of Montgomery County. [At large]
C. Fillmore Chisholm, Jr., of Montgomery County. [Senatorial]
Theodore L. Chisholm, of Montgomery County.
John H. Collins, of Kent County. [Senatorial]
William B. Collins, of Talbot County.
Edgar S. Daugherty, of Somerset County.
Richard Davis, of Howard County.
Francis M. Defandorf, of Montgomery County.
Frank C. Dehler, of Baltimore (Second District).
Cyrus L. Doub, of Frederick County.
Frank J. Downey, of Montgomery County. [At large]
John J. Downey, of Montgomery County.
Richard T. Earle, of Prince George's County.
Benjamin Engelman, of Baltimore (Third District).
Harry Ewald, of Allegany County. [Senatorial]
Abraham Finkelstein, of Baltimore (First District).
Joseph P. Folkoff, of Baltimore (First District).
Frank I. Fonaroff, of Baltimore (Fourth District).
Philip F. Gottling, of Baltimore (Fourth District).
Robert S. Hall, of Baltimore County.
Milton L. Hancock, of Worcester County.
George S. Harris, of Queen Anne's County. [Senatorial]
Louie W. Henck, of Frederick County. [Senatorial]
Francis W. Herring, of Baltimore (Third District).
Charles W. Heas, of Baltimore County.
Norman N. Holland, of Somerset County. [Senatorial]
J. Suter Jammer, of Allegany County.

John R. Johnston, of Washington County.
Bernard Kaplan, of Washington County.
Elmer R. Kauffman, of Carroll County.
Lester S. Kauffman, of Caroline County. [Senatorial]
Clarence E. Keefer, of Baltimore (Third District). [Senatorial]
Louis Klass, of Baltimore (First District).
Abraham J. Levitan, of Baltimore (Fourth District).
George D. Lippy, of Carroll County. [Senatorial]
Lawrence Littman, of Baltimore (Third District).
Walter A. Maccubbin, of Baltimore (Second District).
Jacob E. Miller, of Baltimore (First District). [Senatorial]
Leo D. B. Miller, of Washington County. [Senatorial]
Kent R. Mullikin, of Prince George's County. [Senatorial]
William B. Nelson, of Harford County. [Senatorial]
Robert F. Nicodemus, of Frederick County.
Columbus K. Oakley, of Harford County.
Laurian F. Obrist, of Washington County.
Hyman E. Pivarnick, of Baltimore (Fourth District).
George J. Porter, of Wicomico County.
G. W. Harold Reed, of Washington County.
T. Hardey Rogers, of Frederick County.
Jacob S. Rosenthal, of Baltimore. [At large]
Frederick Scharf, of Baltimore (Third District).
Carl W. Schmidt, of Baltimore (Fourth District).
William W. Selby, of Queen Anne's County.
Murray M. Seymour, of Talbot County. [At large]
Harry B. Shaw, of Frederick County.
Basil F. Sollers, of Baltimore (Second District). [Senatorial]
Walter T. Tibbets, of Howard County. [Senatorial]
Paul E. Tignor, of Wicomico County. [Senatorial]
Francis H. Townsend, Jr., of Baltimore. [At large]
Benjamin T. Truitt, Jr., of Worcester County. [Senatorial]
J. LeRoy Tull, of Anne Arundel County. [Senatorial]
James K. Vickers, of Baltimore County.
C. Lester Warnick, of Allegany County.
Francis P. Weaver, of Baltimore County.
Joseph Weil, of Baltimore (Second District).
J. Roland Wilhelm, of Baltimore County. [Senatorial]
Carroll E. Williams, of Anne Arundel County.
George M. Wingard, Jr., of Talbot County.
Alexander McW. Wolfe, of Baltimore. [At large]
Charles T. Zahn, of Carroll County.
Louis M. Zeskind, of Baltimore (First District).

SCHOOL OF HYGIENE AND PUBLIC HEALTH

TO THE PRESIDENT OF THE UNIVERSITY:

The School of Hygiene and Public Health was not opened to students during the academic year 1917-18, but during this time steps were taken to complete its organization and to select as far as possible the members of the teaching staff. Dr. W. H. Welsh was designated as Head of the Department of Bacteriology and Immunology, with Dr. W. W. Ford as Associate Professor of Bacteriology and Dr. C. G. Bull as Associate Professor of Immunology. Dr. W. H. Howell was designated as Head of the Department of Physiological Hygiene, and Professor C. J. Tilden, Professor of Civil Engineering in the University, was placed in charge of the organization of the work in Sanitary Engineering. Dr. E. V. McCollum, Professor of Agricultural Chemistry in the University of Wisconsin, was appointed to the Chair of Chemistry in the School to take charge of instruction and investigation in Chemical Hygiene. Professor McCollum organized his department on the research side during the year. A staff consisting of an associate, an instructor, and an assistant was appointed, and provision was made for the housing and care of a large rat colony for experimental work in nutrition.

Investigative work along the lines of diet and nutrition was in active progress in this department during the year 1917-18, and some of the results of this work have already appeared in published form. Dr. Raymond Pearl, Biologist of the Maine Agricultural Experiment Station, and Chief of the Statistical Division of the United States Food Administration, was appointed Head of the Department of Biometry and Vital Statistics. With the exception of the research work in Nutritional Hygiene none of the departments of the School were in active operation during the session of 1917-18. Frequent conferences were held during this year to determine the character of the courses to be offered in the School and to define the requirements for admission.

In the early part of 1918 a Preliminary Announcement was issued as the January number of the *Johns Hopkins University Circular*. The Announcement contained a list of the Faculty as far as definite appointments had been made, a brief history of the origin of the School, an announcement in regard to the courses and degrees to be given, and also in regard to fellowships, scholarships, etc., and a list of the courses and public lectures proposed for the ensuing session. It became apparent in the fall of 1917 that it would not be possible under the existing war conditions to begin the construction of a new building, and, in order that the School might certainly open in the fall of 1918, it was decided to prepare the building on West Monument Street, used formerly by the Department of Physics of the University, for temporary occupation. A very generous appropriation was made by the Rockefeller Foundation for the purpose of renovating this building and providing it with suitable furniture

and scientific equipment. Changes in the building were made in accordance with plans submitted by the members of the Faculty, and steps were taken at once to secure an ample outfit of scientific apparatus. I am glad to report that, in spite of difficulties created by the war situation, very satisfactory arrangements have been made in regard to equipment and the selection of a teaching staff, and that the School of Hygiene and Public Health will be ready to begin active work at the commencement of the academic year in October, 1918.

W. H. HOWELL,
Assistant Director.

REPORT OF THE DIRECTOR OF THE GYMNASIUM

TO THE PRESIDENT OF THE UNIVERSITY:

The year 1917-1918 has brought about many changed conditions in the work of the Gymnasium Department. The work, however, has been going on eminently satisfactorily both from an administrative point of view and from the active athletic viewpoint. We have not had the services, as expected, of the athletic instructor, R. G. Murphy, who was engaged to take care of the organization of intramural athletics, as well as to look after the coaching staffs of the University athletic teams. Mr. Murphy was released to engage in war work.

We have endeavored, even under the unusual war conditions, to organize our athletics under the efficient service of our instructor in physical training, Mr. Kistler, and we have had some activity as regards intra-class games and intra-company games, both of which offer a wonderful field of development if we can obtain the necessary physical equipment, instruction, and time. Along this line we are looking forward to making the most use out of the organization at hand. Mr. Kistler will endeavor to take care of the intra-college games, and the athletic association will look after the inter-collegiate games; both are doing what they can to develop athletics here on a real collegiate basis. They are establishing a custom on each of the various teams of developing its own coaching staff from among its own graduates. This has proved successful only partially so far, and if developed will bring about a more healthful state in our collegiate athletics.

The General Athletic Association has had a most successful year, though it has had to economize in every possible way to offset the lack of gate receipts, which have been about 50% below normal during the year. The teams representing us have been among the best that we have ever had, and we are proud to say the personnel of the teams, as well as their spirit, has been the highest that has existed at this institution.

Though our football season from one point of view was not successful, we had more spirit and true enjoyment out of the games, as far as the personnel of the team is concerned, than we had ever had. The track team did excellent work all through the season, and the lacrosse team, which won the championship, did excellent work. On the whole the teams were better than we have had in years, and were financed on a smaller basis than ever before. The basketball team was the best that ever represented us, and was in the same class as the lacrosse team.

More than 40% of our undergraduate students have engaged in intercollegiate athletics, being represented on the four official teams—football, track, baseball and lacrosse. If we took into considera-

tion the intra-class football, baseball, and lacrosse teams, and those active in tennis, our percentage would run up to about 80% of those actively engaged in some form of athletics.

There were 273 students examined, including all of the first and second year men, and a few of the third and fourth years, especially those who were members of the battalion. All battalion members have to be certified as to their physical fitness. We have had a really wonderful year when we consider how the personnel of the various teams and even of the athletic board itself has changed time and again, owing to the various individuals being taken into government service.

The high standard of all the teams has been maintained and the work of the athletic association has gone on even better than usual. We have a prospect next year of securing a better time for athletic work and a more suitable time for the physical training. We shall carry on a physical training class at the same time that we have the military drill, which will be an hour in the mid-day; and, with this stated morning hour, we shall have more efficient work. The athletic teams will take their practice time after five o'clock, and owing to the "new time" will have sufficient daylight for practice.

We can say that the work of the gymnasium department has been arranged so that the battalion will in every way be encouraged. Every student in the undergraduate department should be a member of the battalion and the physical training necessary should be given to the members of the battalion as such; we should not be compelled to give a separate class in physical training, as at present.

We were represented at the meeting of the National Collegiate Athletic Association in New York, and your delegate was retained for another year as the representative of this district and a member of the executive committee.

RONALD T. ABERCROMBIE,
Director of the Gymnasium.

REPORT OF THE DEPARTMENT OF MILITARY SCIENCE AND TACTICS

TO THE PRESIDENT OF THE UNIVERSITY:

On October 1, 1917, the Reserve Officers Training Corps at this institution entered upon its second year, with the following enrollment:

First-year students.....	179
Second-year students.....	69

The unit consisted of three companies of infantry and a drum corps.

Lieutenant C. Winslow Elliott, Fourth Infantry, the Professor of Military Science and Tactics of the previous year, having been returned to duty with troops on account of the war, Captain George R. Guild, U. S. Army, retired, was detailed to the unit and reported for duty.

In order to increase the efficiency of the unit, the disciplinary methods in vogue at the United States Military Academy at West Point, were instituted, and had the support of both faculty and students.

Owing to the fact that the nation was at war, military instruction was intensified, and students devoted approximately the following number of hours to military instruction:

First-year students.....	6 hours per week.			
Second-year students:				
Officers	10	"	"	"
N. C. O.'s and Privates..	8	"	"	"

This instruction was divided into

Infantry Drill, etc.....	4 hours per week.
Lecture	1 hour " "
Class-room quiz.....	1 hour " "
Practical Military Eng.....	2 hours " "
Officers' School.....	2 hours " "

On June 3, 1918, eighty-four students of the unit reported for one month's training at the Training Camp, Plattsburg, New York, and of this number 14 remained for a further course of instruction at that camp.

For the purpose of assisting the Professor of Military Science and Tactics, the following members of the faculty accepted instructor rank in the R. O. T. C. and gave their services to the unit:

1. Captain C. J. Tilden, Engineer Reserve Corps, *Professor of Civil Engineering.*
2. Mr. A. G. Christie, *Associate Professor of Mechanical Engineering.*
3. Mr. G. R. Jones, *Associate Professor of Civil Engineering.*
4. Dr. J. T. Singewald, Jr., *Associate Professor of Economic Geology.*
5. Mr. J. H. Bringham, *Associate in Civil Engineering.*
6. Dr. W. B. Kouwenhoven, *Associate in Electrical Engineering.*
7. Dr. R. T. Abercrombie (Surgeon), *Director of the Gymnasium.*
8. Mr. T. Kistler (Physical Director), *Gymnasium Instructor.*

In addition to the above, the following took military training throughout the entire year, as privates, and accepted Instructor R. O. T. C. rank at the end of the year:

Dr. H. Bassler, Fellow by Courtesy, and Mr. J. E. Uhler, Graduate Student.

The instruction force was further augmented by the following students of the Senior Class, who accepted instructor rank in the R. O. T. C.:

Mr. J. E. Konze, Mr. F. V. Morley, and Mr. T. H. Spiers.

Two non-commissioned officers, Principal Musician A. Wernecke, Cavalry Retired, and 1st Sergeant W. R. Martin, Cavalry Retired, were detailed to the unit for duty. Thus the unit was equipped with an efficient instructing staff, consisting of

- 1 U. S. Army officer, Commandant.
- 1 Officer, U. S. Reserve Corps, Assistant Commandant.
- 5 Members of the faculty, Instructors.
- 3 Senior student Instructors.
- 1 Surgeon.
- 1 Physical Director.
- 2 Non-Commissioned Officers, U. S. Army.

As the members of the faculty and senior-student instructors represented the Civil Engineering, Electrical Engineering, Mechanical Engineering, and Geological Departments, the Military Department was able to give an excellent course in military engineering, topography, etc. The year's training resulted in a splendid unit, rigidly disciplined, well instructed, and possessing very high morale.

On August 15, 1918, the institution opened night classes in Military Art for the benefit of civilians in the vicinity of Baltimore, who desired to prepare themselves for military service. Two additional instructors, Captain W. H. King, D. S. O., 52d Battalion, Canadian Infantry, and Mr. F. V. Morley, a recent graduate engineer, were employed to assist the U. S. Army officer. Classes were to be limited to 100, but the demand for entrance to these classes was so great that a limit of 300 was set, and approximately 200 applicants were turned away, owing to lack of instructors and equipment sufficient to handle so great a number.

The period of instruction was three months, three nights a week, from 7 p. m. to 10 p. m., alternating on one night practical instruction in drill, bayonet, hand grenade, etc., and on another night

indoor instruction in lectures, topography, small problems for infantry, the war game, etc.

The personnel of this class was very high, the class including many men of prominence, residents of Baltimore. Many of these men went to training schools for officers, and were at these schools when the armistice was signed.

A report was made to the War Department, and it received the appreciation and approval of the Secretary of War.

G. R. GUILD,
Captain, U. S. A. Retired.

REPORT OF THE REGISTRAR

TO THE PRESIDENT OF THE UNIVERSITY:

During the year 1917-1918 the academic staff included two hundred and seventy-five teachers,—ninety-four in the philosophical and engineering departments, one hundred and seventy-six whose work lay wholly or chiefly in medicine, five in the school of hygiene. In addition, there were forty-nine instructors—not members of the regular teaching body—in the College Courses for Teachers, the Summer Courses, and the Courses in Business Economics; and there were eighteen lecturers, most of them non-resident, who gave single lectures or short courses. The number of students enrolled in the regular courses was nine hundred and five, of whom four hundred and sixty-four were residents of Maryland (Baltimore, three hundred and seventy), four hundred and nineteen came here from forty-four other States and Territories of the Union, and twenty-two from foreign countries. Among the students were five hundred and fifty-two pursuing graduate courses, of whom one hundred and fifty-seven were enrolled in the department of Philosophy and the Arts (including fifty-two women), three hundred and ninety in the department of Medicine (including fifty-six women), and five in the department of Engineering. There were two hundred and ten candidates for the degree of Bachelor of Arts, one hundred and thirty-three candidates for the degree of Bachelor of Science in Engineering, and thirteen were enrolled as special students, pursuing courses of study for which they seemed fitted, without reference to graduation. The college courses for teachers were attended by three hundred and fifty persons; the summer college and graduate courses of 1917 by five hundred and eighteen; the summer courses for physicians (1917) by fifty-two. The evening courses in business economics were followed by three hundred and fifty-one persons and those for technical workers by two hundred and seven. The enrollment for the year is summarized below:

<i>Faculty</i>	
President and Professors.....	66
Clinical Professors.....	7
Associate Professors.....	39
Associates	38
Instructors and Assistants.....	125
	275
Lecturers for the year.....	18
Additional Instructors in College Courses for Teachers, Summer Courses, and Courses in Business Economics.....	49
<i>Students</i>	
I. Graduate Students:	
A. Department of Philosophy:	
1. Fellows by Courtesy.....	14
2. Fellows:	
University	10
Adam T. Bruce.....	2
William S. Rayner.....	1
Edmund Law Rogers.....	1
3. Other Graduate Students:	
a. Candidates for higher degrees.....	89
b. Special Students.....	40
	157

B. Department of Medicine:		
1. Candidates for the degree of Doctor of Medicine	373	
2. Physicians attending Special Courses.....	17	390
C. Department of Engineering:		
Candidates for the degree of Bachelor of Science in Engineering.....	5	
II. Undergraduate Students:		
1. Candidates for the degree of Bachelor of Arts..	146	
2. Candidates for the degree of Bachelor of Science in Engineering.....	117	
3. Candidates for Matriculation	80	
4. Special Students.....	13	
	<hr/>	356
		908
III. Attendants on College Courses for Teachers:		
1. Candidates for the degree of Bachelor of Science,	44	
2. Candidates for Matriculation.....	4	
3. Special Students.....	302	350
IV. Attendants on Evening Courses:		
1. Business Economics.....	351	
2. Technical Courses.....	207	558
V. Attendants on Summer Courses, 1917:		
1. Courses for Physicians.....	52	
2. Graduate and College Courses.....	518	
	<hr/>	570
Total receiving instruction.....		2386
Counted twice.....		154
Net total.....		2232

During the first forty-two years of the University's existence, nine thousand and six individuals attended the regular courses. Three thousand six hundred and forty-eight were registered as from Maryland (two thousand seven hundred and fifty-five from Baltimore) and five thousand three hundred and fifty-eight from eighty-four other states and foreign countries. Six thousand and sixty-eight persons entered as graduate students and two thousand nine hundred and thirty-eight as undergraduates. Of the latter seven hundred and thirty-seven have subsequently followed graduate courses here, many of them proceeding to higher degrees. The total number of persons who have pursued graduate studies is seven thousand three hundred and thirty-three. The following table shows the enrollment by years from the beginning:

	Total *	Graduates	Undergraduates	
			Candidates for Degrees	Special
1876-77	89	54	12	23
1877-78	104	58	24	22
1878-79	123	63	25	25
1879-80	159	79	32	43
1880-81	176	102	37	37
1881-82	175	99	45	31
1882-83	204	125	49	30
1883-84	249	159	53	27
1884-85	290	174	69	47
1885-86	314	184	96	34
1886-87	373	228	108	42
1887-88	430	231 { Phil., 220 Med., 11	127	62
1888-89	394	216 { Phil., 202 Med., 14	129	49
1889-90	404	229 { Phil., 209 Med., 20	130	45
1890-91	463	276 { Phil., 233 Med., 43	141	51
1891-92	547	337 { Phil., 298 Med., 39	140	70
1892-93	551	347 { Phil., 297 Med., 50	133	71
1893-94	532	344 { Phil., 281 Med., 63	123	55
1894-95	589	412 { Phil., 284 Med., 128	126	51
1895-96	596	406 { Phil., 253 Med., 153	149	41
1896-97	520	344 { Phil., 210 Med., 134	144	32
1897-98	641	456 { Phil., 215 Med., 241	132	33
1898-99	649	462 { Phil., 210 Med., 252	133	24
1899-1900	645	469 { Phil., 185 Med., 284	159	17
1900-01	651	473 { Phil., 168 Med., 305	158	20
1901-02	694	530 { Phil., 172 Med., 358	153	6
1902-03	695	532 { Phil., 187 Med., 345	147	16
1903-04	715	556 { Phil., 202 Med., 354	141	18
1904-05	746	563 { Phil., 195 Med., 368	160	23
1905-06	720	530 { Phil., 162 Med., 368	163	27
1906-07	671	504 { Phil., 158 Med., 346	146	21
1907-08	683	518 { Phil., 171 Med., 347	142	23
1908-09	731	562 { Phil., 187 Med., 375	133	31
1909-10	821	596 { Phil., 183 Med., 407	143	14
1910-11	916	625 { Phil., 210 Med., 415	130	10
1911-12	1206	623 { Phil., 217 Med., 406	170	9
1912-13	1090	600 { Phil., 215 Med., 385	192 { A. B., 165 S. B. (E), 27	8

* Including those enumerated in table of College Courses for Teachers, etc., and excluding duplicates.

	Total*	Graduates	Undergraduates	
			Candidates for Degrees	Special
1913-14	1325	607 { Phil., 213 Med., 378 Eng., 16	249 { A. B., 170 S. B. (E), 79	14
1914-15	1413	637 { Phil., 235 Med., 383 Eng., 19	273 { A. B., 169 S. B. (E), 104	16
1915-16	1668	625 { Phil., 226 Med., 380 Eng., 19	303 { A. B., 175 S. B. (E), 128	21
1916-17	2667	687 { Phil., 249 Med., 371 Eng., 17	384 { A. B., 219 S. B. (E), 165	13
1917-18	2232	552 { Phil., 157 Med., 390 Eng., 5	348 { A. B., 210 S. B. (E), 133	13

The enrollment in the College Courses for Teachers and the other courses established from time to time since 1909 is given below. The figures for the Summer Courses are in each case for the Summer of the year first named.

	College Courses for Teachers	Summer Courses	Business Courses	Night Technical Courses
1909-10	69			
1910-11	101			
1911-12	118	335		
1912-13	119	201		
1913-14	167	347 { Coll., 277 Med., 70		
1914-15	189	356 { Coll., 287 Med., 69		
1915-16	343	487 { Grad., 65 Coll., 363 Med., 59		
1916-17	435	654 { Grad., 110 Coll., 485 Med., 59	499	208
1917-18	350	570 { Grad., 102 Coll., 416 Med., 52	351	207

* Including those enumerated in table of College Courses for Teachers, etc., and excluding duplicates.

The enrollment in the medical department, not including the summer courses, has been as follows:

	Candidates for M. D.	Drs. of Med.	Total.		Candidates for M. D.	Drs. of Med.	Total.
1893-94	18	65	83	1906-07	262	83	346
1894-95	51	77	128	1907-08	277	70	347
1895-96	84	69	153	1908-09	297	78	375
1896-97	123	11	134	1909-10	324	73	407
1897-98	167	74	241	1910-11	351	65	416
1898-99	197	55	252	1911-12	355	51	406
1899-1900	211	73	284	1912-13	351	34	385
1900-01	209	96	305	1913-14	360	18	378
1901-02	229	129	358	1914-15	361	22	383
1902-03	256	89	345	1915-16	353	27	380
1903-04	276	78	354	1916-17	358	13	371
1904-05	291	77	368	1917-18	372	17	390
1905-06	293	75	368				

The geographical distribution of the students in the regular courses is shown by the following table:

	From Maryland.	From Other States and Countries.		From Maryland.	From Other States and Countries.
1876-77	59	30	1897-98	279	362
1877-78	71	33	1898-99	277	372
1878-79	76	47	1899-1900	262	333
1879-80	97	62	1900-01	270	381
1880-81	95	81	1901-02	273	421
1881-82	97	78	1902-03	283	412
1882-83	106	98	1903-04	294	421
1883-84	123	126	1904-05	312	434
1884-85	130	160	1905-06	304	416
1885-86	130	184	1906-07	257	414
1886-87	162	216	1907-08	267	416
1887-88	199	221	1908-09	311	430
1888-89	183	211	1909-10	286	456
1889-90	215	189	1910-11	337	478
1890-91	235	233	1911-12	337	465
1891-92	273	271	1912-13	358	442
1892-93	266	295	1913-14	436	420
1893-94	260	262	1914-15	467	439
1894-95	260	329	1915-16	491	468
1895-96	272	334	1916-17	578	455
1896-97	254	266	1917-18	464	441

The attendance upon the regular graduate and undergraduate courses has been as follows during the last five years:

	1913-14	1914-15	1915-16	1916-17	1917-18
Mathematics	174	198	208	240	207
Physics and Astronomy	177	191	170	185	156
Chemistry	130	147	127	166	148
Geology and Mineralogy	57	65	63	53	58
Zoology, Botany, Plant Physiology	83	86	73	89	61
Greek	51	36	30	38	36
Latin	74	55	54	55	69
Classical Archaeology and Art	35	18	20	25	20
Sanskrit and Comparative Philology	26	33	25	22	29
Semitic Languages	22	17	32	34	57
English	251	271	248	299	293
German	116	114	110	117	105
French, Italian and Spanish	149	177	165	207	197
History	85	81	85	105	72
Political Economy	80	104	96	138	113
Political Science	24	31	55	36	30
Philosophy, Psychology and Education	75	...	...	...	...
Psychology	...	17	23	41	...
Philosophy and Education	...	82	...	...	...
Philosophy	...	...	132	130	83
Education	...	...	10	22	20
Engineering (Civil, Elec. and Mech.)	47	78	96	112	94

The following tables record the enrollment by subjects in the College Courses for Teachers and in the Summer Courses since their initiation:

College Courses for Teachers

	1909- 10	1910- 11	1911- 12	1912- 13	1913- 14	1914- 15	1915- 16	1916- 17	1917- 18
Mathematics	9	15	6	..	6	..	..	6	..
Chemistry .....	..	10	..	..	6	..	20	10	19
Biology	1	4	..	..	..	..	..	1	..
Latin	3	..	6	4	6	..	..	..	..
Hebrew .....	..	..	..	1	..	..	..	..	..
English Composition..	29	28	36	26	27	27	49	44	38
English Literature...	16	8	22	32	49	46	50	70	68
German	4	6	9	23	25	5	22	39	27
French	2	5	12	17	35	33	33	43	53
History	7	15	12	4	8	9	10	12	38
Education .....	..	14	21	21	21	43	73	121	93
Psychology .....	..	..	..	7	9	11	34	46	..
Political Economy....	..	..	..	..	..	16	34	42	13
Hygiene .....	..	..	..	..	..	7	7	20	..
Italian .....	..	..	..	..	..	..	11	11	..
Spanish .....	..	..	..	..	..	..	6	18	29
Life Insurance.....	..	..	..	..	..	..	42	..	..
Biblical Archaeology..	..	..	..	..	..	..	..	3	2
Hist. of Ancient East..	..	..	..	..	..	..	..	7	5
History of Art.....	..	..	..	..	..	..	..	35	25
History of Israel.....	..	..	..	..	..	..	..	2	..
Literature of Bible..	..	..	..	..	..	..	..	3	4
Philosophy .....	..	..	..	..	..	..	..	2	26
Physics .....	..	..	..	..	..	..	..	1	..
Political Science.....	..	..	..	..	..	..	..	..	12
Drawing .....	..	..	..	..	..	..	..	..	1

Summer Courses

	1911	1912	1913	1914	1915	1916	1917	1918
Mathematics	23	8	9	16	19	12	11	10
Physics	14	11	7	13	27	20	8	..
Chemistry	25	29	41	28	39	40	27	27
Biology	59	9	19	18	15	16	30	15
Latin	22	9	12	9	6	7	14	6
English Composition.....	121	65	51	68	72	93	40	26
English Literature.....	48	39	37	49	35	53	32	34
German	33	24	20	20	46	41	24	6
French	26	26	15	27	29	27	42	56
Spanish .....	..	..	..	7	9	20	19	13
History	56	31	50	43	44	71	40	57
Education	172	95	143	135	245	337	313	156
Domestic Science and Art..	24	15	27	22	31	17	14	5
Manual Training.....	24	4	19	12	24	31	24	17
Politics .....	..	..	..	14	18	9	7	7
Playground and Recreation.	..	..	..	..	18	14	..	10
Psychology .....	..	..	..	..	15	57	50	8
Geography .....	..	..	..	..	..	28	11	..
Economics .....	..	..	..	..	..	11	28	17
Penmanship .....	..	..	..	..	..	84	33	..
Fine Arts .....	..	..	..	..	..	..	34	30
Philosophy .....	..	..	..	..	..	..	16	20
Semitic Languages.....	..	..	..	..	..	..	17	4
Vocational Education.....	..	..	..	..	..	..	..	5

Degrees were conferred during the year upon one hundred and ninety-three candidates—Bachelor of Arts, forty-seven; Bachelor of Science in Engineering, twenty-six; Bachelor of Science, eight; Master of Arts, thirteen; Doctor of Philosophy, twelve; Doctor of

Medicine, eighty-seven. Since degrees were first conferred, in 1878, thirteen hundred and seventy-four persons have attained the degree of Bachelor of Arts; seventy-eight, the degree of Bachelor of Science in Engineering; fourteen (including seven women), the degree of Bachelor of Science; ninety-eight (including thirty women), the degree of Master of Arts; ten hundred and eighty-two (including twenty-eight women), the degree of Doctor of Philosophy; and fourteen hundred and four (including one hundred and twenty-eight women), the degree of Doctor of Medicine. The total number of individuals graduated is thirty-six hundred and seventy-three. Certificates of proficiency in applied electricity were awarded to ninety-one persons from 1889 to 1899.

Summary of Degrees Conferred

A. B. Ph. D. M. D.						A. B. Ph. D. M. D. A. M. B. S. B. S. (Eng.)							
1877-78	-	8	-	4	- ..	1897-98	-	49	36	22	..	..	..
1878-79	-	8	-	0	- ..	1898-99	-	38	42	33	..	..	..
1879-80	-	16	-	5	- ..	1899-1900	-	46	35	43	..	..	..
1880-81	-	12	-	9	- ..	1900-01	-	43	30	53	..	..	..
1881-82	-	15	-	9	- ..	1901-02	-	47	17	57	..	..	..
1882-83	-	10	-	6	- ..	1902-03	-	46	27	49	..	..	..
1883-84	-	23	-	15	- ..	1903-04	-	37	31	45	..	..	..
1884-85	-	9	-	13	- ..	1904-05	-	33	35	54	..	..	..
1885-86	-	31	-	17	- ..	1905-06	-	48	32	35	..	..	..
1886-87	-	24	-	20	- ..	1906-07	-	47	35	76	..	..	..
1887-88	-	34	-	27	- ..	1907-08	-	47	28	63	..	..	..
1888-89	-	36	-	20	- ..	1908-09	-	37	27	53	4	..	..
1889-90	-	37	-	33	- ..	1909-10	-	14	25	69	3	..	..
1890-91	-	51	-	28	- ..	1910-11	-	31	28	85	11	..	..
1891-92	-	41	-	37	- ..	1911-12	-	37	32	85	5	..	..
1892-93	-	40	-	28	- ..	1912-13	-	36	32	76	11	..	..
1893-94	-	41	-	34	- ..	1913-14	-	52	30	91	13	..	..
1894-95	-	37	-	47	- ..	1914-15	-	35	31	89	12	3	..
1895-96	-	37	-	36	- ..	1915-16	-	27	37	82	13	12	3
1896-97	-	36	-	42	- 15	1916-17	-	44	44	92	13	37	3
						1917-18	-	47	12	87	13	26	8
						<hr/>							
						1374	1082	1404	98	78	14		

THOMAS R. BALL,
Registrar.

REPORT OF THE OFFICIAL STATE BUREAUS CONNECTED WITH THE UNIVERSITY

TO THE PRESIDENT OF THE UNIVERSITY:

I submit herewith a report of the official State Bureaus connected with the University and conducted in co-operation with the Geological Department.

THE MARYLAND GEOLOGICAL SURVEY

The Maryland Geological Survey has now been in existence for twenty-two years, having been established by an Act of the General Assembly in March, 1896. The work has been in charge of Professor Clark as State Geologist from the beginning until his death in July, 1917. The appropriations during the first two years amounted to \$10,000 annually. In 1898 a second Act was passed providing \$5,000 additional to be used chiefly in the preparation of a base map of the State. These appropriations remained in effect until the end of the fiscal year September 30, 1916, when an Act of the Legislature abolished all continuing appropriations. For the two fiscal years ending September 30, 1918, the Survey was allotted \$14,000 annually, while the Legislature of 1918, under the new budget system, has appropriated \$15,025 and \$15,115 for the fiscal years ending September 30, 1919 and 1920, respectively.

The Survey devotes its activities chiefly to geological studies and to the preparation of topographic maps of the State, although consideration is also given independently or in co-operation with other bureaus, both Federal and State, to the study of problems connected with the terrestrial magnetism, hydrography, agricultural soils and forestry of the State.

The Survey maintained for twelve years, from 1898 to 1910, a Highway Division. During the earlier years of this period the work was largely advisory. A testing laboratory was established and plans and specifications for road and street improvement by the State, county, and municipal authorities were prepared. In 1904 an Act was passed providing for the construction of State Aid roads, \$200,000 annually being appropriated by the State, to be met by an equal amount from the counties, the work to be done under the plans, specifications, and supervision of the State Geological Survey. In 1906, 1908, and 1910, \$384,000 in all were appropriated for the construction, under the auspices of the Geological Survey, of a modern highway from Baltimore to Washington. Altogether over \$1,500,000 were appropriated by the State and counties to be spent under the auspices of the Survey, and over 150 miles of modern roadway were constructed. During this period the various deposits available for road construction throughout the State were tested, as well as the various materials employed on the streets of most of the cities and towns of the State. Much advice in the matter of road and street

construction was given to the public officials. In 1910 the highway work of the Survey was transferred to the State Roads Commission, which had been organized in 1908, and of which President Remsen and Professor Clark were members until 1914. On the death of Professor Clark, Dr. Mathews, who had been associated with the work of the Survey from its inception in 1896, was appointed State Geologist and was succeeded by Professor Berry as Assistant State Geologist.

The geological work, which is directly under the charge of the State Geologist and the Assistant State Geologist, is divided into three divisions, covering the areas of the Piedmont Plateau, the Appalachian Region, and the Coastal Plain. Investigations are in progress in all these districts and extensive areas in each have already been studied. Reports have been issued for Allegany, Cecil, Calvert, St. Mary's, Prince George's, and Anne Arundel counties, while the investigations have been completed for Harford, Kent, Queen Anne's, Talbot, Caroline, and Washington counties. Work is now in progress in Baltimore, Frederick, Carroll, and Howard counties. In the conduct of the geological work the aid of numerous experts in the various parts of the country has been sought, particularly in the study of the several groups of fossil animal and plant remains. Monographs on the Devonian, Lower Cretaceous, Upper Cretaceous, Eocene, Miocene, Pliocene, and Pleistocene deposits of the State have already been published, and similar reports on other formations are now in preparation. Special economic reports on building stones, clays, coals, limestones, water resources, and iron ores have been issued and work is now in progress on the fire clays of western Maryland.

The results of topographical work conducted in co-operation with the United States Geological Survey are presented to the public on the scale of one mile to one inch, in the form either of 15' sheets or of county maps, showing the topography and election districts. They present in a very detailed manner not only the relief of the land, but cultural features as well. Maps of all the counties have already been published. One additional sheet of the map of Baltimore and vicinity on the scale of 1000 feet to the inch was issued during the year, which now includes seven sheets covering 140 square miles.

The investigations in terrestrial magnetism, hydrography, agricultural soils, and forestry have been proceeding, as hitherto, in co-operation with State and National bureaus. The agricultural soil survey of Carroll and Baltimore counties was completed during the past field season in co-operation with the United States Bureau of Soils and the Agricultural Experiment Station. The forestry work is now, for the most part, in charge of the later-organized State Board of Forestry, but the Geological Survey continues to publish county reports and maps of this subject.

THE MARYLAND WEATHER BUREAU

The Maryland Weather Service has been in existence for twenty-seven years, having been organized in May, 1891, under the joint auspices of the Johns Hopkins University, the Maryland Agricultural College, and the United States Weather Bureau. It was established

as an official organization by the General Assembly of 1892, the Act being approved by the Governor in April of that year. The State Weather Service under this Act was permanently placed at the Johns Hopkins University, under the direction of a Board of Control nominated by the heads of the three institutions above mentioned, and subsequently commissioned by the Governor. The appropriation for the maintenance of the Bureau was \$2,000 annually up to September 30, 1916, the fund being used mainly for investigations relating to the climatology of the State. Although the Legislature of 1916 failed to make an appropriation for the term of 1916-1918 the organization was maintained and the work continued until the new appropriation of the Legislature of 1918 became available. After the death of Professor Clark, who had been the chief of the Bureau since its organization, Professor Mathews was commissioned Director by Governor Harrington.

The Weather Service has published, in addition to many minor reports and bulletins, three large final volumes, the first dealing with the physiography and meteorology of the State at large, the second with the climate and weather of Baltimore and vicinity, and the third with the distribution of plant life, particularly in its relations to climate and soils.

The Weather Service has taken up, under the direction of Professor Livingston, of the Johns Hopkins University, a quantitative study of the results of climatic factors upon vegetation. By growing various cultivated plants at different stations throughout the State under similar soil conditions and keeping a careful quantitative record of their growth, changes, and physiological activity, it is expected that accurate data will be obtained showing the result of the varying climatic conditions on crop production. A preliminary pamphlet has already been issued.

Another important line of work is the study of the rainfall which is being conducted by Dr. Fassig, Chief of the Baltimore office of the United States Weather Bureau. In connection with this and in cooperation with the State Geological Survey and State Department of Health an investigation of the surface and underground water resources of the State has been completed.

THE MARYLAND FORESTRY BUREAU

An Act was passed by the General Assembly of 1906 providing for a State Board of Forestry, to consist of seven members, four of whom are *ex officio*, the same as the commissioners of the Geological Survey, the fifth is the State Geologist, while the sixth and seventh are appointed by the Governor.

Professor Mathews is the executive officer of the Board and has been authorized by it to see that the provisions of the Act are carried out. Mr. F. W. Besley is the State Forester. Under this Act \$3,500 were appropriated for the first two years and \$4,000 annually for the succeeding four years, while an additional \$1,000 were appropriated by the General Assembly of 1910 to meet the expenses of publication of forestry maps. The Legislature of 1912 greatly increased the

resources and powers of the State Board of Forestry by appropriating \$10,000 annually for the general expenses of the Board, beside \$50,000 for the purchase of lands in the valley of the Patapsco River in Baltimore and Howard counties for a State Reservation, \$8,500 for the purchase of old Fort Frederick and the surrounding lands in Washington county, and \$6,000 for the publication of maps and reports. At the same time provision was made for the establishment of a State Forest Nursery, which is located on land put at the disposal of the Board by the Maryland Agricultural College, at College Park. The Legislature of 1914 passed laws, at the suggestion of the Board, providing for the preservation of roadside trees and the planting of shade trees along the highways. At the same time it prohibited the placing of unauthorized signs along the public roads. The administration of these laws is in the hands of the Board. Upon the termination of the continuing appropriation of \$10,000 annually on September 30, 1916, the General Assembly provided for the maintenance of the forestry work for the following two years, appropriating the sum of \$14,000 annually—\$5,000 of this amount to be employed each year for fire protection in co-operation with the United States Forest Service and \$1,000 for the care of the Patapsco Reservation. Under the new budget system the Bureau receives \$20,338 and \$19,800 for 1918 and 1920, respectively.

The State Forester and his assistants have prepared plans for more economical forest management of the woodlands of the State and have, on request, given advice to a large number of owners of wood lots throughout the State. One of the chief aims of the Forestry Board has been the education of the people of the State in matters pertaining to forest management in order that the growing timber of the State may be utilized to the greatest advantage.

CO-OPERATION

Much aid has been rendered the several State bureaus above mentioned by the chiefs of the various Federal bureaus. Particular reference should be made to the co-operation granted by the Director of the United States Geological Survey, the Chief of the United States Weather Bureau, the Chief of the United States Forest Service, the Director of the United States Bureau of Mines, and the Chief of the United States Bureau of Soils, all of whom have cordially supplemented the work of the State organizations in many ways. The work of the State bureaus is in progress along so many lines that it affords admirable opportunities for the students of the University to obtain much practical experience, both in the field and in the laboratory; at the same time the State receives much benefit from the trained force of men which is always at its disposal.

EDWARD BENNETT MATHEWS.

REPORT OF THE DIRECTOR OF THE BUREAU OF APPOINTMENTS

TO THE PRESIDENT OF THE UNIVERSITY:

I respectfully submit the following report of the activities of the Bureau of Appointments of this University for the nine months ending with Commencement, June 11, 1918.

The war has affected the work of the Bureau in a variety of ways. There has been naturally a marked decrease in the registration of graduate students, particularly men. One result of this has been a somewhat low record of appointments, for we have had repeated applications for teachers of subjects, especially science, in which no candidates were available; and in other cases candidates who would in normal times have accepted vacant positions have preferred to go into some form of war-work. On the other hand, there has been a decided increase in the registration of undergraduates, and the service of the Bureau to students who wish to work part of their time during the college year and full-time during vacations has shown gratifying results. There is reason to hope that this work can be extended next year, for the number of students who apply for employment is increasing, and business men in Baltimore are beginning to learn that Hopkins students are available. A request for information as to the work done by our undergraduates during the summer of 1917 brought responses from fifty-two students. A tabulation of their replies is appended. The part-time incomes of students during the college year of 1916-1917 ranged from \$800, the salary of an undergraduate clergyman, to \$3.10 a game, earned by a student who did clerical work in connection with the football games. The Bureau keeps a file of applications for employment, and coöperates in every way possible with self-supporting students.

It has been possible for the Bureau to be of material service to the schools of Baltimore and Maryland by supplying emergency substitutes when the exigencies of war-times created vacancies. Students whose college work was of high grade have been sent to serve in such cases for brief periods, and in one instance the Bureau was able to send an unusually competent senior to teach science in one of the county high schools for more than two months.

To this report I append a tabular list of applications for teachers, according to subject, with the number of appointments, so far as these can at present be ascertained; a list of applications in general; and a statement of the registration and the correspondence of the Bureau.

	Applications	Recommendations	App'tm'ts
Teachers	79	40	10
Business	19	27	19
Camp counsellor.....	1	2	
Dean of School of Education..	1		
Dean	1	2	

	Applications	Recommendations	App'tm'ts
Headmistress	1	1	
Assistant Principal.....	2		
Proctor	1	2	
Reader	2	2	1
Tutor	11	10	7
Summer tutor.....	2	2	1
President of College.....	2	2	

	Applications	Appointments
Athletics	2	
Biology	7	
Chemistry	8	
Economics	1	
Education	1	
English	11	3
French	7	2
German	4	1
Greek	1	
History	5	1
Latin	1	
Manual Training.....	2	
Mathematics	8	2
Metallurgy	1	
Modern Languages.....	4	
Physics	3	
Romance Languages	2	
Science	4	
Social Science.....	1	
Spanish	1	

NEW REGISTRATION

Undergraduates	24
Graduate Students.....	15
Former Students.....	15
Summer School.....	1
Unclassified	6

61

Letters	218
Circulars	300
Telegrams	1
Telephone calls.....	500

THE EMPLOYMENT OF STUDENTS, SUMMER OF 1917

Average Summer income..... \$165.13

Kind of work	No. of students	Av. rate per week
At Camp Meade during construction.....	8	\$23.50
Farming	6	8.41
In munition plants.....	6	17.94
Clerks and secretaries.....	7	11.85
Surveying	4	17.21
Laboratory work.....	4	11.21
Tutoring	3	*
Salesmen	2	6.50
At the postoffice.....	2	....
In factories.....	2	....
On the ship.....	1	10.89
Miner	1	27.00
Chauffeur	1	15.00
Electrician	1	13.92
Reporter	1	14.00
Cashier	1	15.00
Printer	1	9.00

* Usually paid by lesson.

Kind of work	No. of students	Av. rate per week
Stock boy.....	1	8.00
In machine shop.....	1	12.00
On State roads.....	1	12.00
Telephone company.....	1	12.00
Camp counsellor.....	1	6.00

9 earned less than \$100.
17 earned between \$100 and \$200.
17 earned between \$200 and \$300.
2 earned between \$300 and \$400.
1 earned \$400.

JOHN C. FRENCH,
Director.

REPORT OF THE YOUNG MEN'S CHRISTIAN ASSOCIATION

TO THE PRESIDENT OF THE UNIVERSITY:

I beg to submit the following report on the work of the Association during the year 1917-18:

Receptions

There were three receptions during the year. The first was the regular fall reception, held in October, soon after the University opened. This was largely attended by the students. Dr. Brush, Dr. Kelly, Mr. Lindley, several of the students, and the General Secretary were the speakers. The second was held in November, in response to the great Student Friendship War Fund Campaign. All of the leading students of the University attended and plans were laid to carry on the campaign. The third was held in April, as a closing reception for the year. The work of the year was reviewed, and prophecies for the coming year were declared.

Chapel

This, in many respects, was the most successful work done during the year. It was necessary this year to hold the services at the noon hour instead of in the morning, due to the early classes. The services were only twenty minutes long, from 12:40 to 1 o'clock, and were held every day except Saturday. We were fortunate in having an efficient chapel committee and they were able to secure some of the best speakers in the city. The maximum attendance was about forty-five, and the minimum about fifteen. There was a fine spirit shown among the students, and they have expressed their appreciation of these services.

Meetings

These were held every Wednesday, though not always under the auspices of the Association. However, upon several occasions the Association was in charge, and the meetings were a great success. The constant demand for speakers on the war made it impossible for us to secure enough in order to hold the meetings regularly.

Bible Study

The schedule of the University was so full that there was no time during the day when we could hold Bible classes for the students. But we were able to hold one large Bible class every Tuesday evening at the Central Y. M. C. A. This class was taught by Rev. Dr. Loren M. Edwards, the Pastor of Grace M. E. Church, a very able teacher and one who gained the admiration of all. The book used was Rauschenbusch's "Social Principles of Jesus." After this class was discontinued, because of Dr. Edwards's announcement concerning his

going to France, we held a discussion group at the same hour on Tuesday evening, led by Rev. Dr. R. W. Hogue. The average attendance at both these classes was about fifteen.

Mission Study

This work has been very discouraging. We were unable to secure a teacher for a class and could not find the time to hold one. The missionary cause, however, was not entirely forgotten, as we had a lecture by Dr. Philip S. Evans, of the Johns Hopkins Medical School, a returned missionary doing research work. We also sent a delegate to the Northfield Missionary Conference, who gave a report of its proceedings.

Deputation Work

The work of this committee was the most successful in its history. There were two deputation teams composed of six men each. These two teams held twenty-four meetings during the year. The first part of the year they visited the Christian Endeavor Societies of the largest churches in the city. The team would have charge of the entire meeting. Talks were made on the body, mind, and spirit, emphasizing the entire man, and assuring the people that the college man is an example of this principle. The second part of the year the teams visited the rural districts for the first time, and did most successful work. Here a number of the churches would combine and the team would take charge of the entire service. We have received letters from the Ministers telling of the wonderful results of these meetings. Meetings were held in such places as Belair, Sykesville and Reisterstown.

Community Service Work

The work of the Community Service Committee was encouraging, although hindered by losing almost all of its members on account of the war. It managed, however, to secure quite a number of other students to continue the work. It did good work in the West Park Recreation Centre and in the Lawrence House. The prospects are very encouraging for next year.

Other Committee Work

The Reading Room Committee secured the best magazines, which furnished good reading for the students. The Membership Committee secured about sixty members. The New Student Committee interested quite a number of the new students and they will be active next year. The Social Committee arranged for the receptions and handled their part well. The Music Committee rendered fine music at all the Chapel Services and on special occasions.

Special Work

This year as well as last there was a Y. M. C. A. Student Friendship War Fund Campaign. It was a great success. We raised \$1,154.00, surpassing the previous year by over \$400.00. This was a very good proportion, considering the small number of undergraduate students. David R. Porter, the Secretary of the International Com-

mittee, a personal friend of mine, came to Baltimore at my suggestion and delivered a thrilling address at the University. The Committee appointed did heroic work, and next year, when this time comes again, I feel sure the University will give a great deal more, because I believe the Y. M. C. A. will ask for \$100,000.00.

Conferences

There was a special conference held for the State of Maryland at the Central Building, in November, to consider the Friendship Fund Campaign. Professor French, W. L. Merriken, C. T. Leber and I attended the Conference. A special Bible Conference was held for Maryland in January and was attended by William L. Merriken and the General Secretary. In April a Conference to consider plans for the coming year was held at the University of Pennsylvania, and W. W. Almy and W. L. Merriken were the delegates. There was a Missionary Conference held at Northfield during the Christmas holidays, and H. H. Mersereau, who lives in New York, was our representative. There is to be a great conference at Northfield in June, and Messrs. Almy, Merriken, Wyckoff, Hoffmeister and I expect to attend and represent Johns Hopkins.

Personal

I want to express my appreciation of the privilege of being associated with the University this year as its Y. M. C. A. Secretary and one of its students. The Association has done good work in its first year of the war. The men on the Cabinet of the University Y. M. C. A. were new at the work this year. But I expect to hear of great things next year. This has been the foundation year in the new location, and the years to follow will, no doubt, be filled with very much greater achievements.

KLEIN K. HADDAWAY,
General Secretary.

REPORT OF THE DEAN OF THE MEDICAL FACULTY

TO THE PRESIDENT OF THE UNIVERSITY:

I have the honor to submit the following report of the activities of the Medical Department of the University during the year ending September 30, 1918.

The total enrollment of candidates for the degree of Doctor of Medicine was 375. Six students withdrew for various causes, reducing the number to 369 at the end of the academic year.

The degree of Doctor of Medicine was conferred upon eighty-seven students. Of these, thirty were conferred on April 5, 1918, upon students who went to France with the Johns Hopkins Base Hospital in May, 1917, upon the recommendation of the members of the Faculty serving as officers in the unit. Immediately thereafter all of them were commissioned as first lieutenants in the Medical Corps and assumed active duty in France. Posthumous degrees were conferred upon two of the student members of the unit, who died in France, namely, Edwin S. Linton and Lyle B. Rich. At Commencement, June, 1918, degrees were conferred upon fifty-five students, and on October 1, 1919, upon two others who had not completed the requirements for graduation at the time of Commencement.

I regret to report that our Faculty has sustained serious losses during the year by the death of Franklin Paine Mall on November 17, 1917, and of Theodore C. Janeway on December 27, 1917.

Dr. Mall had been professor of Anatomy from the beginning of the school in 1893, and had rendered invaluable services to it, more particularly in extending the field of human anatomy. An appropriate minute was passed by the Faculty on December 21, 1917, and a public meeting in memory of his services was held on Sunday, February 13, 1918, when addresses were made by President Woodward of the Carnegie Institution of Washington and Drs. Florence R. Sabin, Lewellys F. Barker, and William H. Welch of our Faculty.

Dr. Janeway was appointed professor of Medicine on May 5, 1914, and was the first incumbent of the chair under the full time system, rendering highly valuable services during the period of readjustment. A minute was passed by the Faculty in recognition of his services, and an impressive memorial service was held March 17, 1918, at which addresses were made by Surgeon-General Gorgas, Dr. Samuel W. Lambert of the College of Physicians and Surgeons, New York, Mr. Preston Clark, of Boston, Dr. David Edsall, Professor of Medicine at Harvard, and Drs. Howland and Welch of our Faculty.

Dr. William Sydney Thayer was appointed Professor of Medicine in succession to Dr. Janeway on February 15, 1918, but as he was absent in France as Chief Medical Consultant to the Expeditionary

Forces, Dr. Louis Hamman, Associate Professor of Clinical Medicine, was appointed as locum tenens and as acting head of the department of Medicine, with a temporary seat in the Advisory Board of the Medical Faculty, and assumed duty October 1, 1918.

The war made great inroads upon our teaching staff, seventy-nine of whose members accepted commissions, mostly in the Medical Department of the Army. This necessitated radical changes throughout the school, but I am glad to report that in spite of the serious reduction in the number of teachers and the absence of many of the most important members of the Faculty, the work was carried on successfully and with but slight diminution in value. The University is under great obligations to those who remained for the efficient manner in which they carried forward the work of the school.

In addition to conducting the regular teaching work, the Medical School placed its facilities as far as possible at the disposition of the Government. The most important work carried on within the school was the establishment of the Neuro-Surgical Laboratory of the Army, under the leadership of Dr. Lewis H. Weed. This laboratory was housed partly in the Anatomical Building and partly in the New Hunterian Laboratory, and made important researches in various problems connected with brain and nerve surgery. Facilities were also afforded for research work conducted under the auspices of the Food Administration upon the value of fish foods.

The war likewise necessitated a number of other changes, particularly the omission of summer courses for physicians, which was deemed necessary on account of the depletion of the teaching staff and the general conditions attending a state of war. Other important changes consisted in the institution of an obligatory course in War Bacteriology for fourth year students, conducted by Dr. MacCallum, and a practical course in the treatment of venereal diseases, conducted by Dr. Geraghty. Both of these courses were given in order to prepare our graduates to render more valuable services as Army medical officers.

The physical examination of all students in the school was continued as in former years, and Dr. Bloomfield reported that the results were very satisfactory.

I am glad to report that on March 22, 1918, Mr. Kenneth Dows increased our obligations to him by contributing an additional sum of \$2,000. for the purpose of providing a contingent fund supplementary to the Dows Tuberculosis Fund.

Scholarships for 1917-18 were granted to H. L. Darner of the second year, B. Sacks and H. L. Willis of the third year, and to H. E. Blair, L. D. Keyser and J. H. Kite of the fourth year class.

The Joseph Kernochan Garr Scholarship was awarded to H. L. Fisher.

I regret to report that Dr. Eldon W. Sanford, Assistant in Anatomy, died at his home in Hamden, Conn., as the result of an infection contracted during the conduct of his work, and also that seven of our alumni died during the year: Edwin S. Linton (1918)

November 14, 1917; Lyle B. Rich (1918) December 8, 1917; Patrick J. Cassidy (1898) January 28, 1918; Harold S. Morgan (1915) May, 1198; William H. White (1907) May 9, 1918; Joseph L. Nichols (1897) June 17, 1918; and Joseph D. Cohn (1911) September 30, 1918.

During the year the following changes in the teaching staff were made:

I. PROMOTIONS

University Staff

- Dr. Admont H. Clark, from Associate to Associate Professor of Pathology.
- Dr. Emil Goetsch, from Associate to Associate Professor of Surgery.
- Dr. Lloyd D. Felton, from Instructor to Associate in Bacteriology.
- Dr. H. Hays Bullard, from Instructor to Associate in Pathology.
- Dr. Stanley Cobb, from Assistant to Associate in Psychiatry.
- Dr. George A. Harrop, from Assistant to Instructor in Medicine.
- Dr. Linda B. Lange, from Assistant to Instructor in Medicine.
- Dr. John W. Harris, from Assistant to Instructor in Obstetrics.
- Dr. Eather L. Richards, from Assistant to Instructor in Psychiatry.
- Dr. Adrian S. Taylor, from Assistant to Instructor in Surgery.
- Dr. Vernon Lynch, from Assistant to Instructor in Physiology.
- Dr. Sydney O. Reese, from Assistant to Instructor in Gynecology.
- Dr. J. Julian Chisolm, from Assistant to Instructor in Laryngology.

Clinical Staff

- Dr. Richard H. Follis, from Associate to Associate Professor of Clinical Surgery.
- Dr. Sydney R. Miller, from Instructor to Associate in Clinical Medicine.
- Dr. G. Lane Taneyhill, from Instructor to Associate in Clinical Neurology.
- Dr. Charles M. Byrnes, from Instructor to Associate in Clinical Neurology.
- Dr. Albert Keidel, from Instructor to Associate in Clinical Medicine.
- Dr. Harry L. Homer, from Assistant to Instructor in Clinical Surgery.
- Dr. J. W. Pierson, from Assistant to Instructor in Clinical Roentgenology.
- Dr. Leo J. Goldbach, from Assistant to Instructor in Clinical Ophthalmology.
- Dr. M. Randolph Kahn, from Assistant to Instructor in Clinical Ophthalmology.

II. NEW APPOINTMENTS

University Staff

- Dr. Edward P. Carter, Lecturer in Medicine.
- Dr. William S. Miller, Lecturer in Medicine.
- Dr. William P. Finney, Jr., Instructor in Pathology.
- Dr. Annabella E. Richards, Instructor in Physiological Chemistry.
- Dr. Henry H. Hampton, Instructor in Gynecology.
- Dr. Francis E. Roberts, Assistant in Gynecology.

Dr. Hallie M. Clark, Assistant in Medicine.
 Dr. S. Ernestine Howard, Assistant in Medicine.
 Dr. William C. McKee, Assistant in Obstetrics.
 Dr. Karl H. Martzloff, Assistant in Pathology.
 Dr. Frederick H. Linthicum, Assistant in Laryngology.
 Dr. Emile F. Holman, Assistant in Surgery.
 Dr. Mark H. Tibbetts, Assistant in Orthopedic Surgery.
 Dr. Frederick E. B. Foley, Assistant in Pathology.
 Dr. Herman J. Bollinger, Assistant in Bacteriology.

Clinical Staff

Dr. DeWitt B. Casler, Instructor in Clinical Gynecology.
 Dr. Ernest H. Gaither, Assistant in Medicine.
 Dr. Elliott H. Hutchins, Assistant in Clinical Surgery.
 Dr. Ernest L. Zimmerman, Assistant in Clinical Medicine.
 Dr. Harry M. Robinson, Assistant in Clinical Medicine.

III. RESIGNATIONS

Dr. Herman O. Mosenthal, Associate Professor of Medicine.
 Dr. Charles A. Rouiller, Associate in Pharmacology.
 Dr. John A. Luetscher, Associate in Clinical Medicine.
 Dr. Charles C. Macklin, Associate in Anatomy.
 Dr. Robert S. Cunningham, Instructor in Anatomy.
 Dr. Herbert M. N. Wynne, Instructor in Gynecology.
 Dr. Thomas M. Rivers, Instructor in Pediatrics.
 Dr. Marjorie D. Batchelor, Instructor in Medicine.
 Dr. David W. Carter, Instructor in Medicine.
 Dr. N. E. B. Iglehart, Instructor in Clinical Surgery.
 Dr. Fred H. Kruse, Assistant in Medicine.
 Dr. Alma Hiller, Assistant in Medicine.
 Dr. William C. von Glahn, Assistant in Pathology.
 Dr. Paul W. Christman, Assistant in Pathology.
 Dr. Esau A. Greenspon, Assistant in Pathology.
 Dr. Ruth A. Guy, Assistant in Bacteriology.
 Dr. Janet H. Clark, Assistant in Pathology.
 Dr. G. Bedford Brown, Assistant in Laryngology.

The twenty-nine members of the graduating class mentioned below were appointed as House Officers in the Johns Hopkins Hospital upon the recommendation of the Medical Faculty:

J. W. Baylor	E. F. Holman	D. Phythyon
H. E. Blair	R. W. Houseal	Miss I. M. Richter
F. H. Cathrall	C. S. Jordan	R. L. Rosen
B. Douglass	J. H. Kite	L. Sachs
Miss E. Dunham	C. S. Levy	H. C. Shirley
J. E. Elmendorf	J. G. Mateer	H. G. Stewart
Miss H. Germann	Miss E. S. Michael	H. B. Wadsworth
H. L. Griffith	J. C. Montgomery	J. A. Ward
N. B. Herman	I. W. Nachlas	L. Woolley
R. L. Hillman	Miss K. Pardee	

J. WHITEIDGE WILLIAMS,
Dean.

REPORT OF THE LIBRARIAN

TO THE PRESIDENT OF THE UNIVERSITY:

Herewith is submitted my tenth annual report on the Library—covering the year ending June 30, 1918—the twelvemonth of war.

Unhappily the library staff does not hold the honor of having had a representative among the armed forces of the nation, tho the Assistant Librarian, Mr. Mattern, received preferred classification in the last draft. All members, however, had parts of one kind or another to play, whether engaging in works of mercy, aiding in various campaigns, laboring with the men in training at home or in action overseas.

It is a matter of pride to recall the generous response of the University—Trustees, Faculty, students and staff—to the American Library Association's appeal for book funds, and later for reading material. Professor Ames was chairman and the University Librarian was Secretary of the committee which directed the drive in Baltimore. The libraries and other educational institutions of the city made a commendable record. The University oversubscribed its quota of \$2,500, evenly divided among the five groups of Trustees, Faculty, Students, Library and Library Staff.

Mr. Munzner, upon the recommendation of the Advisory Board, was on May 25 appointed Captain of the Reserve Officers' Training Corps at the University and Adjutant as well, relieving the Battalion Adjutant, assuming, in the absence of the Commandant, direction of the Unit, and becoming responsible for the official mail addressed to the Professor of Military Science and Tactics, etc. His services at this post were widely recognized and appreciated, tho they did not involve his severance of relations with the Library.

To the Librarian there fell the privilege of a journey on a double mission to Europe as the sole official representative abroad of the American Library Association. By courtesy of the President and Board of Trustees, and the kindly consent of Dean M. P. Brush to serve as Acting Librarian, he was absent from January 20 to May 25, spending some ten weeks in France, visiting England twice and Switzerland for a few days.

The task was, first, to arrange for library service to the American Army and Navy overseas; and, second, to open up the way to secure useful enemy publications for universities, colleges, and public institutions of approved character, including a number of the Governmental Departments.

For the former purpose, the Association had been accorded official status by the Commissions on Training Camp Activities, and to the traveler were given letters of authorization and introduction by the

Secretaries of War and Navy to General Pershing and Vice-Admiral Sims respectively. In interviews he will not soon forget, immediate and hearty sanction was given to the plans which had been worked out after arrival in Europe, study of British methods and conference with allied organizations, and been presented by appointment at their respective Headquarters in Chaumont and London, while, despite its preciousness at the moment, special tonnage was provided, including that to serve our prisoners of war, for whom some material was bought in Geneva. To both commanders, grateful acknowledgment is due for according the special privilege of unrestricted passage throught the American War Zone, visitation of naval stations, and a trip with the fleet at sea, so that our service might be based on a scientific survey.

For the other purpose, a license was granted by the War Trade Board, joint instructions issued by the Department of State and Censorship Board, a diplomatic passport provided, and valued introductions given by the Secretary of State to the diplomatic and consular agents of the Department. The negotiations with the British and French Governments were at once successful, reports made to Washington being accepted, and orders then placed in Holland and Switzerland for 107 institutions. This material has come—a select list of the most important periodicals, excluding those in which the propagandist might work—and proved acceptable to the Censor.

In this investigation and transaction, the Embassies at London and Paris and the Legations at The Hague and Berne afforded every facility at their command. Ambassador Page, especially, has created a lasting obligation and implanted an abiding memory of attention to my personal comfort, which went far beyond the requirements of official duty. And it is a pleasure to remember too the aid given by a Baltimorean, Minister Garrett, and by a former student of the University, Mr. J. G. D. Paul, one of his attachés.

ACCESSIONS

As thruout the war, our receipts fell far below normal, especially in exchanges. The number of pieces received was only 48% of the annual average for the triennium immediately preceding the outbreak of war in 1914, tho bound volumes amounted to more than 70%. Just one-fourth the normal amount of exchange material came.

Irrespective of binding we received of books and pamphlets, by purchase, 3863 volumes in 3718; by gift, 3214 volumes in 3187; by exchange, 2280 volumes in 2278; U. S. deposit 198 volumes; Maryland Geological Survey deposit, 45 volumes; J. H. U. dissertations, in manuscript, 25; two copies each of 28 J. H. U. printed dissertations; 33 other publications of ours. Total, 9540 pieces. In addition we received 404 maps (311 by purchase, 92 by gift, and 1 by exchange). Of these receipts, 6060 were bound, but, as 70 volumes were sold or discarded, the net total accessions amounted to 5990 volumes; so the present accession number of bound volumes in the library is 208,237.

PURCHASES

The number of noteworthy works bought was not large. The most extensive acquisitions naturally fell to the School of Hygiene and Public Health, as newly established. As usual, first attention was given to journal files. Sets worth mentioning are:

- Annales d'hygiène publique*, 1829-1916. 175 vols. in 88.
- Archiv f. soziale gesetzgebung u. statistik*. Bde. 1-18 (exc. 3, 7, 16, 17), 1888-1903.
- Institut Pasteur. Bulletin*, t. 1-15. 1903-17.
- Journal of hygiene*, vols. 1-16 (exc. vol. 6, no. 4).
- Journal of infectious diseases*, vols. 1-21.
- London University, Eugenics Laboratory.*
Lectures, 1-10.
Memoirs, 1-20 (exc. 7 and 8).
Biometric Series, 1-9 (exc. 5).
- Revue d'hygiène*, 1879-1915.
- Sanitary institute. Transactions*, 1-30.
- Statistical society. Journal*. 86 v. 1839-1917.
- Zeitschrift f. hygiene*. Bde. 1-61, 1886-1908.

The Library in hygiene has been, for the time being, set up in the room of the old Physical Laboratory formerly occupied by the Rowland Memorial Library, and during the coming year it will be under the care of Miss Elisabeth S. Thies, transferred for the purpose from the Cataloging Department.

It was a pleasure to be able at last to pick up for the Medical School the seven scattered volumes needed between 1868 and 1883 to make continuous our file of *Archives de physiologie normale et pathologique*, tho in securing *Revue générale d'histologie* we missed vols. 2, 4, and 5. To the library in Harriet Lane Home, a full set of *La pediatria*, 1896-1915, was added.

An important accretion to our resources in geology was a set of *Cartes géologiques détaillées de la France*, 1877- , tho the 240 maps secured do not constitute quite a complete file, the rest being now reprinting. The French Government did not stand in the way of delivery in this instance, and acknowledgement is due its courtesy to our Department of Physics in permitting the acquisition of the first Bulletins of the *Institut aéronautique de l'Université de Paris*.

Another case of typical French courtesy and breadth of vision, by which I was able to make American physicians in military service in France the beneficiaries, it is unhappily not yet proper publicly to record, tho that it was unsolicited and comprehended the educational institutions of all the Allies, including the United States, deserves even now a reference at least.

The list of purchases should not be closed without mention of 18 volumes of the American ceramic society *Transactions*, and the years

1883-1898 of *Ephemeris archaïologike* for the Department of Classical Archæology, as well as, for the Department of Economics, the completion of our set of Poor's Manual of Railroads, from 1871, and especially a copy of the rare and costly Misselden's Circle of commerce, published, by initials, in 1623.

GIFTS

There are but few important gifts to be recorded for the year. Mrs. William Bullock Clark presented 358 scientific volumes from the library of the late Professor Clark. Professor W. Macneile Dixon sent us 171 propagandist issues. Henry Holt & Co. continued to favor us with a selection from their current publications, sending this year 38. President Goodnow presented 117 miscellaneous volumes and Ex-President Remsen 89.

A special courtesy of the French Government is to be acknowledged in the gift by its Minister of Foreign Affairs of a set of the Bulletin des Armées de la République, nos. 1-258, Aug. 15, 1914-Aug. 8, 1917. Sets of this interesting war-time issue were presented to five American libraries at the instance of Dr. Anson Phelps Stokes, who organized the Educational Department of the American Y. M. C. A. overseas. The gift is intended as an acknowledgment of the services of welfare organizations in France.

ANALYSIS OF EXPENDITURES

I. Philosophical, Collegiate and Engineering Departments

Salaries		\$15,108.00
Books	\$3,524.05	
Periodicals	2,428.06	
Maps	464.24	
Binding	2,885.92	
Printing and Supplies.....	492.25	
Postage and Transportation.....	390.59	
Soldiers and Sailors Book Fund.....	400.00	
Miscellaneous	76.48	
		<u>\$10,611.59</u>
		\$25,719.59

II. Medical School

Salary		\$ 600.00
Books	\$ 574.32	
Periodicals	916.65	
Binding	94.04	
Soldiers and Sailors Book Fund.....	100.00	
Book Case.....	147.00	
Transportation	43.06	
Miscellaneous	102.05	
		<u>\$1,977.12</u>
		\$2,577.12

III. School of Hygiene and Public Health

Salary		\$ 540.00
Books	\$ 885.15	
Periodicals	1,781.32	
Binding	239.54	
Transportation	108.49	
		<u>\$3,014.50</u>
		\$3,554.50
Total		\$31,851.21

CATALOGING AND CLASSIFICATION

The year's record of the Cataloging Department does not compare favorably with that of last year, which was the first under the regular organization effected after the conclusion of recataloging operations with a special staff—and that too despite the presence of an extra member till March. But before the new member had gained facility with our machinery, she entered service elsewhere, and during my absence overseas no successor was appointed; so that the aid was more nominal than real. The main difficulty, however, lay doubtless in the necessity of changing multigraph operators in October, for some months are required to attain the speed requisite to balanced and economic operation. Thus, tho the number of main entries is, to be sure, 455 (or nearly 6%) more than the preceding year, yet the number of additional cards of various kinds is 5,159 (or 14%) less, and the number of volumes falls off 732 (or 6%). The test of the catalogers, of course, lies in the main entries.

It must be continually borne in mind also that in our system the addition of any new department adds not merely to the labor of the Cataloging Department, but to the complexity of that labor, for a new branch catalog must be set up and kept correlated with others, while in the case of the School of Hygiene, as in three others, a triplicate set has to be made, for insertion at the Medical School. We are making not one complete catalog only, but sixteen departmental ones also, as previously pointed out.

Two permanent losses to the record of the Department were explained in my last report: continuations could no longer be entered in the shelf list by the Order Department, because of its increasing burden, and with the Recataloging Staff dissolved, the Chief Cataloger had to classify current accessions, and thus greatly reduce his own output.

Still Mr. Schulz found the time to continue working off, in conjunction with the multigraph, as in previous years, the contents of various pamphlet series. Those thus disposed of were as follows:

History pamphlets.....	32 vols.
International law pamphlets.....	51 "
German constitutional law pamphlets.....	6 "
German [language and literature] monographs.....	68 "
J. H. U. Medical School collected reprints.....	2 "
	<hr/> 159 vols.

He continued also the revision of entries in the Reading Room catalog, examining those from H to Tr, leaving thus only G and the entries from Ts to Z, since A-F had been handled the previous year.

The following table shows the record of catalogers in detail:

Cards:

Main entries.....	8,246
Duplicate main entries.....	6,278
Added entries.....	15,032
Duplicate added entries.....	7,372
Shelf list cards.....	2,271
Accession cards.....	252
Source cards.....	527
Cross references.....	541
	<hr/> 40,519
Volumes	11,217

Of the *titles* handled cards were received from the Library of Congress for 54%, while 2% came from the Wistar Institute, which has begun to issue preliminary analyticals with textual abstract of its own periodicals and two others. We prepared copy for the remaining 44%.

Of the 40,510 *cards* employed here and 2,500 sent to Washington, as seen below, 51% were printed by the Library of Congress, 2½% by Wistar Institute, 33% on our multigraph, and the remaining 13½% were typewritten.

In the Reading Room catalog, which aims to be complete for the entire University, 25,383 cards were filed by the custodians. The total now is 450,533 cards.

In the Library of Congress depository catalog 35,504 cards representing new entries were filed.

For incorporation in the union catalog of American libraries maintained in Washington by the Library of Congress, we selected 1,400 of our titles for which to send 2,500 cards.

CLASSIFICATION

Mr. Mattern made substantial headway this year in reducing the arrears in classification—arrears due, as will be recalled, to the fact that the recataloging of the library was accomplished faster than schedules were printed in Washington. By handling English drama, Scottish and American literature, the language and literature of English were completed. To these were added the Gaelic and Dutch languages and literatures. Thus we have left only Religion, Church history, Law, Classics and Archaeology, the Oriental and Scandinavian languages and literatures, plus the Italian, Spanish and Portuguese literatures (not the languages).

Mr. Schulz assisted with 158 titles, in addition to 970 titles of current accessions, supplementing those accepted from the Library of Congress.

BINDING

After the systematic overhauling given the shelves last year, when 6004 volumes were sent to the binders, as compared with the annual average of 3738 volumes of the preceding quinquennium, we dropped back this year, as might have been expected to a figure below normal—3181 volumes, in addition to 70 pamphlets put into Gaylord covers. But the cost ran up to \$3,008.70, or 97 cents a volume, as compared with 93 cents last year, or 82 cents the year before that.

This same is, of course, true of all our supplies, the cost of cards, e. g., advancing from \$2.00 per thousand to \$4.50.

INTER-LIBRARY LOANS

In the operation of the inter-library loan system, we borrowed 258 volumes from the following institutions: Columbia (3); Harvard (4); Illinois (9); Jewish Theological Seminary (2); Pan-American Union (9); Pennsylvania University (3); Princeton (1); U. S. Bureau of Education (1); U. S. Department of Agriculture

(3); U. S. Geological Survey (2); U. S. Library of Congress (129); U. S. Surgeon-General's Office (90); Yale (2).

We lent 126 volumes to the following institutions: Bryn Mawr (9); Chicago (5); Columbia (1); Cornell (1); Delaware College (1); Indiana (49); Maryland State Normal School (2); Minnesota (1); Missouri (4); Ohio State University (2); Pennsylvania College (1); Pennsylvania University (5); Philadelphia Free Library (16); Princeton (2); Randolph-Macon Woman's College (8); Smith College (1); U. S. Department of Agriculture (4); U. S. Naval Academy (7); Virginia (2); Western Maryland College (3); Woodstock College (2).

This record is exclusive of loans made to and by local libraries.

ACKNOWLEDGMENT

It would be ungracious indeed if this report were closed without word of praise for those who carried forward the service of the library in the Librarian's absence. If he were tempted to vanity by the smooth running of the machine he had set up, he would be quickly sobered by the reflection that it can evidently do well enough without the old engineer. From Dean Brush, who so generously and acceptably consented to add to his responsibilities already heavy, down to the last associate, it was a fine-tempered and efficient staff that made a contribution overseas possible.

M. L. RANEY,
Librarian.

REPORT OF THE JOHNS HOPKINS PRESS

(ABSTRACT)

TO THE PRESIDENT OF THE UNIVERSITY:

I submit herewith the report of the Johns Hopkins Press for the past year:

American Journal of Insanity. This journal is the official organ of the American Medico-Psychological Association. Its editorial control is in the hands of a committee of the Association, consisting of Doctors Henry M. Hurd, E. N. Brush, of Baltimore; C. Alder Blumer, of Providence, R. I.; J. Montgomery Mosher, of Albany, N. Y., and Charles K. Clarke, of Toronto, Ontario. Volume LXXIV (four numbers) was issued. The volume contained 744 pages, 8vo.

American Journal of Mathematics, edited by Professor Frank Morley, with the co-operation of Professors A. Cohen, Charlotte A. Scott and other mathematicians. Numbers 3 and 4 (234 pages) completing volume XXXIX (454 pages quarto) and two numbers of Volume XL (224 pages) have been issued.

American Journal of Philology, edited by Professors Basil L. Gildersleeve and C. W. E. Miller. Numbers 3 and 4 (242 pages) completing Volume XXXVIII (475 pages, 8vo.) and two numbers (228 pages) of Volume XXXIX have appeared.

Elliott Monographs in Romance Languages and Literatures, edited by Professor E. C. Armstrong. Numbers 4, 5, and 6 are off press. but as these Monographs are printed in France, delivery to us will be somewhat delayed. The subjects are as follows: No. 4, Sources of the Religious Element in Flaubert's *Salammô*, by Arthur Hamilton; No. 5, *Etude sur Patelin* par Richard Th. Holbrook; No. 6, *Libre de Apolonio*, An Old Spanish Poem, edited by C. Carroll Madden, Part I, Introduction and Text.

Hesperia: Schriften zur germanischen Philologie, edited by Professors Collitz and Wood, and *Schriften zur englischen Philologie*, edited by Professor Bright. Several numbers of the English section are being published in America. However, none of these appeared during the past year, although they may be ready within a few months.

Johns Hopkins Hospital Publications. We have continued the publication, on behalf of the Johns Hopkins Hospital, of the *Bulletin*, appearing monthly, and of the *Reports*, of irregular issue.

Of the *Bulletin* six numbers (176 pages) completing Volume XXVIII (392 pages, 8vo.) and six numbers (156 pages) of Volume XXIX have been issued.

Of the *Reports* Volume XVIII No. 2 (338 pages, quarto, and numerous illustrations) appeared in October.

The Johns Hopkins University Circular, including the Annual Report of the President, University Register, Medical Department Catalogue, etc., T. R. Ball, editor. Five numbers (632 pages) completing Volume XXXVI (1038 pages, 8vo.) and six numbers (570 pages) of Volume XXXVII have been issued. These have included Conferring of Degrees, 1917—The Johns Hopkins Philological Association, 1916-1917—Directory of the Summer Courses, 1917; College Courses for Teachers, 1917-1918; Catalogue and Announcements for 1917-1918 of the Medical Department; University Register, 1917-1918, Preliminary Issue; Report of the President of the University, 1916-1917; Preliminary Announcement of the School of Hygiene and Public Health; Commemoration Day, 1918; Summer Courses, 1918; University Register, 1917-1918; College Courses for Teachers—Courses in Business Economics—Night Courses for Technical Workers, 1918-1919; the Johns Hopkins Philological Association, 1918-1919.

The President's Report, Annual Register, and Commemoration Day Exercises are sent to each Alumnus, while the Medical Department Catalogue also is sent to each graduate of that Department.

The Johns Hopkins University Studies in Historical and Political Science. The Studies are issued under the direction of the departments of history, political economy and political science. One number (190 pages) completing Series XXXV (630 pages, octavo) and three numbers (408 pages) of Series XXXVI have been published. These have included "Party Organization and Machinery in Michigan Since 1890," by Arthur Chester Millspaugh; "The Standard of Living in Japan," by Kokichi Morimoto; "Sumptuary Law in Nürnberg: A Study in Paternal Government," by Kent Roberts Greenfield; "The Privileges and Immunities of State Citizenship," by Roger Howell.

The Johns Hopkins University Studies in Education. Under this title there was recently begun a series of Monographs, edited by Professor Edward F. Buchner, with the co-operation of Dr. C. Macfie Campbell. These Studies will include monographs presenting the results of investigations conducted at the University or elsewhere, which, because of their importance, should appear as separate units and at once. There have appeared two numbers, "The Correlation of Abilities of High School Pupils," (100 pp.), by David Emrich Weglein, and "Experimental Study of Motor Abilities of Children in the Primary Grades, (62 pp.), by Buford Jennette Johnson. The third number containing the experiments conducted at the Summer School of last year is about ready for press.

Modern Language Notes. This journal is edited by Professors James Wilson Bright (Editor-in-chief), Murray Peabody Brush, William Kurrelmeyer and Gustav Gruenbaum. Two numbers (144 plus x pages of bibliography) completing Volume XXXII (528 pages plus lviii pages of bibliography, octavo), and six numbers (384 pages plus xxvi pages of bibliography) of Volumes XXXIII have been issued.

Terrestrial Magnetism and Atmospheric Electricity, edited by Dr. Bauer. Numbers 3 and 4 (104 pages) completing Volume XXII (200 pages, 8vo) and one number (44 pages) of Volume XXIII were issued.

Institutional Care of the Insane in the U. S. and Canada. Volume 4 (664 pp., 8vo) appeared in August 1917. This completed the work in four volumes, totaling 2,936 pages. These volumes were published for the American Medico-Psychological Association.

Early Diplomatic Relations Between the U. S. and Japan, by Payson J. Treat, 468 pages, 12mo. This volume appeared in October 1917, and is a continuation in the series of the Albert Shaw Lectures on Diplomatic History.

The West Florida Controversy, 1798-1813, by Isaac Joslin Cox, 702 pages, 12mo. This was published in April 1918, and is also a continuation in the Albert Shaw Lectures on Diplomatic History.

The Eclogues of Faustus Andrelinus and Ioannes Arnolletus, by Wilfred P. Mustard, 123 pages, crown 8vo. This volume was published in February 1918, and is the third of a series of Latin texts on Studies in the Renaissance Pastoral.

The J. E. Aldred Lectures on Engineering Practice, 1916-1917. This was published in August 1917, and includes three lectures each on Civil, Electrical and Mechanical Engineering. It contains 254 pages, 8vo and numerous illustrations. The lectures for 1917-1918 are now in press, and will soon appear.

UNIVERSITY BOOK STORE

In this department are included text-books ordered by members of the University; also books sent to us on inspection by the publishers. There were received during the year 6,497 volumes, including 240 volumes sent on consignment. Of these, 5876 volumes were purchased by the members of the University, 120 by the Library, 182 were returned to the publishers, and 319 added to stock.

DISSERTATIONS PUBLISHED DURING THE YEAR

Following is a list of dissertations for the degree of Doctor of Philosophy, published during the year, of which the required number of one hundred and fifty copies have been received by the University:

Armstrong, Mary Emma: *The Significance of Certain Colors in Roman Ritual.*

Campion, John L.: *Das Verwandtschaftsverhältnis der Handschriften des Tristan Ulrichs von Türrheim, nebst einer Probe des kritischen Textes.*

Connolly, Gerald Charles. *The Difference in Chemical Activity of Free and Semicombined Water as Illustrated by the Effect of Neutral Salts of Hydrolysis of Acetic Anhydride.*

Dickey, Robert William: *The application of the Plane Grating to the Determination of the Index of Refraction of a Gas with Values for Air from λ 2500 to λ 6500.*

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English Bagby, of Baltimore, A. B., Princeton University, 1913. *Subjects*: Psychology, Physiology, and Psychiatry. *Dissertation*: Psychological Effects of Insufficient Oxygenation.

Paul Frederick Bloomhardt, of Altoona, Pa., A. B., Pennsylvania College, 1909; Gettysburg Theological Seminary, 1912. *Subjects*: Hebrew, Assyriology, and History of the Ancient East. *Dissertation*: The Book of Haggai. *Referees on Dissertation*: Professors Haupt and Ember.

John Allan Child, of Lakewood, N. J., A. B., Harvard, 1899. *Subjects*: Italian, French, and Spanish. *Dissertation*: The Subjunctive in the Decameron. *Referees on Dissertation*: Professors Shaw and Armstrong.

Teresa Cohen, of Baltimore, A. B., Goucher College, 1912; A. M., Johns Hopkins University, 1915. *Subjects*: Mathematics, Physical Chemistry, and Chemistry. *Dissertation*: Investigation on the Plane Quartic. *Referees on Dissertation*: Professors Morley and Coble.

George Edwin Dorsey, of Baltimore, A. B., Johns Hopkins University, 1914. *Subjects*: Geology, Mineralogy, and Chemistry. *Dissertation*: The Stratigraphy and Structure of the Triassic System of Maryland, with a Discussion of the Origin and Climatic Significance of Red Beds. *Referees on Dissertation*: Professors Mathews and Berry.

Howard Samuel Fawcett, of Riverside, Cal., B. S., Iowa State College, 1905; M. S., University of Florida, 1908. *Subjects*: Plant Physiology, Physical Chemistry, and Climatology. *Dissertation*: The Temperature Relations of Growth in Certain Parasitic Fungi. *Referees on Dissertation*: Professors Livingston and Johnson.

Emerson Bennette Helm, of Miami, Fla., B. S., University of Florida, 1915. *Subjects*: Chemistry, Physical Chemistry, and Mineralogy. *Dissertation*: Adsorption of Gases by Charcoal. *Referees on Dissertation*: Professors Patrick and Frazer.

Vernon Lynch, of Baltimore, A. B., Johns Hopkins University, 1914. *Subjects*: Physiology, Physiological Chemistry, and Histology. *Dissertation*: The Function of the Nucleus of the Living Cell. *Referees on Dissertation*: Professors Jennings and Mast.

John Broadus Mitchell, of Richmond, Va., A. B., University of South Carolina, 1913. *Subjects*: Political Economy, Political Science, and History. *Dissertation*: The Rise of Cotton Mills in the South. *Referees on Dissertation*: Professors Hollander and Barnett.

William Hay Taliaferro, of Portsmouth, Virginia, B. S., University of Virginia, 1915. *Subjects*: Zoology, Plant Physiology, and Psychology. *Dissertation*: Reaction to Light in *Planaria Maculata*

with Special Reference to the Function and Structure of the Eyes. *Referees on Dissertation*: Professors Jennings and Mast.

Charles Callan Tansill, of Brookland, D. C., A. B., Catholic University of America, 1912. *Subjects*: History, Political Science, and English Literature. *Dissertation*: William Learned Marcy: His Political Activities from 1823 to 1832. *Referees on Dissertation*: Professors Latané and Vincent.

Alvin Thalheimer, of Baltimore, A. B., Harvard University, 1914. *Subjects*: Philosophy, Political Economy, and Political Science. *Dissertation*: The Meaning of the Terms "Existence" and "Reality." *Referees on Dissertation*: Professor Lovejoy and Dr. Slonimsky.

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DOCTOR OF MEDICINE

Clement HARRISSE Arnold, of San Francisco, Cal., A. B., Stanford University, 1910.

John Ward BAYLOR, of Wardell, Va., A. B., Washington and Lee University, 1914.

Harry Edwin BLAIR, of Hagerstown, Md., A. B., Western Maryland College, 1914.

Herman John BOLLINGER, of Toledo, O., S. B., Heidelberg University (Ohio), 1914.

David Thomas BOWDEN, of Passaic, N. J., A. B., Johns Hopkins University, 1914.

Albert Howell BREWSTER, of Atlanta, Ga., A. B., University of Virginia, 1914.

Friedman HOLMES Cathrall, of West Pittston, Pa., S. B., Bucknell University, 1914.

Richard GILMORE COBLENTZ, of Baltimore, A. B., Johns Hopkins University, 1914.

Frank DAVIES CONROY, of Cullowhee, N. C., A. B., University of North Carolina, 1914.

Alva Brown CRADDOCK, of Jackson's Gap, Ala., S. B., Howard College, 1908.

Edgar Mortimer DAY, of Pittsburgh, Pa., A. B., Princeton University, 1914.

John LANAHAN DORSEY, of Baltimore, A. B., Johns Hopkins University, 1914.

Beverly DOUGLAS, of Nashville, Tenn., Litt. B., Princeton University, 1914.

Ethel COLLINS DUNHAM, of Hartford, Conn., A. B., Bryn Mawr College, 1914.

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Frederick Eugene BASIL FOLEY, of St. Paul, Minn., Ph. B., Yale University, 1913.

Lawrence Stokes Fuller, Jr., of Laurens, S. C., S. B., University of South Carolina, 1914.

Leslie Tracy Gager, of Norwich, Conn., A. B., Yale University, 1914.

Hildegard Catherine Germann, of Quincy, Ill., A. B., Vassar College, 1913.

Lawrence Getz, of Baltimore, A. B., Johns Hopkins University, 1914.

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Nathan Bernard Herman, of Baltimore, A. B., Johns Hopkins University, 1914.

Rolfe Louis Hillman, of St. Paul, Va., A. B., Emory and Henry College, 1914.

Emile Frederic Holman, of Oakland, Cal., A. B., Stanford University, 1911, and University of Oxford, 1916.

Robert Wright Houseal, of Newberry, S. C., A. B., Newberry College, 1911; A. M., University of Virginia, 1913.

John Gardiner Huck, of Baltimore, A. B., Johns Hopkins University, 1913.

Walter Hughson, of Morgantown, N. C., S. B., Princeton University, 1914.

John Edabduel Huiskamp, of Baltimore, A. B., Harvard University, 1898.

S. Lloyd Johnson, of Masontown, Pa., A. B., Goshen College, 1914.

Carl Fred Jordan, of Burlington, Ia., A. B., State University of Iowa, 1914.

John Albert Key, of St. Petersburg, Fla., S. B., Alabama Polytechnic Institute, 1913.

Linwood Dickens Keyser, of Roanoke, Va., A. B., University of Virginia, 1914.

Joseph Hiram Kite, of Elkton, Va., A. B., Randolph-Macon College, 1914.

Janina Constance Klecan, of Portland, Ore., A. B., Lemberg (Austria) Gymnasium, 1903.

Amos Ralph Koontz, of Stanley, Va., A. B., and S. B., College of William and Mary, 1910.

Louis Frederick Krumrein, of Baltimore, A. B., George Washington University, 1914.

Clifford M. Lane, of Washington, Pa., A. B., Washington and Jefferson College, 1913.

Carlisle Sanford Lentz, of Omaha, Neb., A. B., Creighton College, 1914.

Charles Sumner Levy, of Baltimore, A. B., Johns Hopkins University, 1914.

Jennings Sipe Lincoln, of Graham, Va., A. B., Elon College, 1911.

Edwin Scott Linton, of Washington, Pa., A. B., Washington and Jefferson College, 1913.

Albert Smith McCown, of Lexington, Va., A. B., Washington and Lee University, 1910.

William Frank McFee, of Concord, Tenn., A. B., University of Tennessee, 1914.

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Frank Robert Menagh, of Denison, Ia., A. B., State University of Iowa, 1914.

Edith S. Michael, of Cambridge, Mass., A. B., Lyceum Fliegelmann, Vienna, 1911.

John Chalmers Montgomery, of Coldwater, Mich., A. B., University of Michigan, 1914.

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Daniel Phythyon, of Belle Vernon, Pa., S. B., Westminster College (Pa.), 1914.

Clarence Chipley Porter, of Baltimore, A. B., Johns Hopkins University, 1914.

John Paul Rankin, of Elyria, O., A. B., Ohio Wesleyan University, 1914.

Clarence Albert Ransom, of Washington, D. C., S. B., Fargo College, 1914.

Lyle Barnes Rich, of Willow City, N. Dak., A. B., University of North Dakota, 1914.

Ina May Richter, of Santa Barbara, Cal., A. B., Bryn Mawr College, 1908.

Robert Rosen, of Detroit, Mich., S. B., Michigan Agricultural College, 1913.

Emmet Orren Rushing, of San Angelo, Tex., A. B., University of Texas, 1913.

Louis Sachs, of Baltimore, A. B., Johns Hopkins University, 1914.

William Justus Merle Scott, of Cleveland, O., A. B., Oberlin College, 1914.

Harold Clinkscales Shirley, of Honea Path, S. C., S. B., Military College of South Carolina, 1913; A. M., University of South Carolina, 1914.

Woodruff Smith, of Baltimore, A. B., Williams College, 1914.

John Deane Southworth, of Glendale, O., A. B., Kenyon College, 1911.

Edward D. Spalding, of Detroit, Mich., S. B., Princeton University, 1914.

Horace Gentry Stewart, of Gallipolis, O., S. B., Massachusetts Institute of Technology, 1914.

Phebe Stone, of China, A. B., Goucher College, 1914.

Ralph Easterday Swartz, of Arkansas City, Kan., A. B., University of Kansas, 1914.

Karl Hart Tannenbaum, of Crawfordsville, Ind., A. B., Wabash College, 1914.

Van Noyes Verplanck, of South Manchester, Conn., A. B., Yale University, 1914.

Harvey Bryan Wadsworth, of Cove City, N. C., A. B., University of North Carolina, 1909.

Charles Edward Wagner, of Lock Haven, Pa., Ph. B., Dickinson College, 1914.

James Alto Ward, of Hartford, Ala., A. B., Howard College, 1914.

Lawson Wilkins, of Baltimore, A. B., Johns Hopkins University, 1914.

Louis Alexander Witzeman, of Akron, O., A. B., Harvard University, 1913.

LeGrand Woolley, of Salt Lake City, Utah, A. B., University of Utah, 1911.

Rodes Estill Yager, of Georgetown, Ky., S. B., Georgetown College, 1913.

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MASTER OF ARTS

John H. Cloud, of Valparaiso, Ind., A. B., Valparaiso University, 1896. *Subject*: Physics. *Essay*: Airplane Instruments: Their Historical Development and Underlying Physical Principles. *Referees on Essay*: Professors Ames and Pfund.

Harrison Cadwallader Coffin, of Baltimore, A. B., Johns Hopkins University, 1916. *Subject*: Latin. *Essay*: Vergil in the Christian Writers. *Referees on Essay*: Professors Smith and Mustard.

Mary Theresa Dallam, of Baltimore, B. S., Johns Hopkins University, 1916. *Subject*: English. *Essay*: A Study of Certain Aspects of the Poetry, the Philosophy, and the Criticism of Samuel Taylor Coleridge. *Referees on Essay*: Professors Bright and Greene.

Eleanor Diggs, of Roland Park, Md., A. B., Goucher College, 1915. *Subject*: History. *Essay*: The North Atlantic Coast Fisheries Dispute, 1783-1910. *Referees on Essay*: Professors Latané and Vincent.

Hugh Latimer Dryden, of Baltimore, A. B., Johns Hopkins University, 1916. *Subject*: Physics. *Essay*: Airplanes: An Introduction to the Physical Principles Embodied in Their Use. *Referees on Essay*: Professors Ames and Pfund.

Victor Dulac, of Washington, D. C., A. B., George Washington University, 1915. *Subject*: French. *Essay*: The Philosophy of Voltaire, 1711-1726. *Referees on Essay*: Professors Brush and Blondheim.

Anabel Eugenia Hartman, of Baltimore, A. B., Goucher College, 1908. *Subject*: English. *Essay*: Wordsworth's Views on Other Poets, as Expressed in His Own Prose and Poetry and Reported Conversations. *Referees on Essay*: Professors Bright and Greene.

James Herbert Owens, of Havre de Grace, Md., A. B., Randolph-Macon College, 1904. *Subject*: Education. *Essay*: High School Costs in Maryland. *Referees on Essay*: Professor Buchner and Dr. Weglein.

Nellie Frances Pelton, of Laramie, Wyo., A. B., Oberlin College, 1912. *Subject*: English. *Essay*: The Minor Poems of Edmund Spenser. *Referees on Essay*: Professors Bright and Greene.

Dorsey Richardson, of Baltimore, A. B., Johns Hopkins University, 1915. *Subject*: Political Science. *Essay*: The Internment of Belligerent Men-of-War by Neutral Nations; The English Blockade. *Referee on Essay*: Professor Willoughby.

Jane Van Ness Smead, of Carlisle, Pa., A. B., University of Paris, 1916. *Subject*: French. *Essay*: Montesquieu and Madame de Staël: Their Theory of Climate. *Referees on Essay*: Professors Blondheim and Dargan.

Lucile Douglas Smith, of Cynthiana, Ky., A. B., Transylvania University, 1904. *Subject*: English. *Essay*: The Political Satire in English Literature from the Accession of George III to the Close of the Eighteenth Century. *Referees on Essay*: Professors Bright and Greene.

William Harry Hazard White, of Harford County, Md., A. B., Harvard University, 1905. *Subject*: Education. *Essay*: Testing the Efficiency of the School System of Harford County, Maryland. *Referees on Essay*: Professor Buchner and Miss Bamberger.

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